

Nova Scotia Agricultural College / Your Atlantic University College of Agriculture

LINK TO THE FUTURE

NSAC

Calendar 1998 - 1999



Link to the Future

Nova Scotia Agricultural College

Ninety-third Calendar

1998-1999

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

EMAIL: reg_info@nsac.ns.ca

INTERNET: <http://www.nsac.ns.ca/nsac/>

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

TABLE OF CONTENTS

MISSION STATEMENT.....	4
STATEMENT OF VALUES.....	4
SCHEDULE OF DATES	5
ADMISSIONS INFORMATION	7
SCHEDULE OF FEES	10
REGULATIONS AND PROCEDURES.....	21
EXPLANATION OF TERMS AND CODES.....	21
UNDERGRADUATE DEGREE PROGRAMS	22
TECHNICIAN PROGRAMS	51
TECHNOLOGY PROGRAMS.....	58
BACHELOR OF TECHNOLOGY	66
DESCRIPTION OF COURSES - UNDERGRADUATE AND TECHNICAL.....	68
GRADUATE PROGRAM AND COURSES.....	114
SCHOLARSHIP INFORMATION	134
GENERAL INFORMATION.....	139
CENTRE FOR CONTINUING AND DISTANCE EDUCATION.....	139
ADMINISTRATION AND FACULTY	144
INDEX	148

MISSION STATEMENT

The Nova Scotia Agricultural College takes a leading role in providing education, research and public service in the agricultural and food industries and related disciplines. The College is dedicated to helping people acquire the skills, wisdom and independence needed for a lifetime of learning and contribution to the well-being of Atlantic Canada and other regions, both Canadian and international.

STATEMENT OF VALUES

In support of their mission, the faculty and staff of the College espouse the following values:

Excellence

We seek to achieve excellence in all we do. Our evaluation of ourselves and our students should reflect this high standard. We seek continuous improvement in our teaching, research and service and expect from our students, faculty and staff a dedication and commitment to these pursuits.

Leadership

We provide leadership in the pursuit of truth, innovation and solutions to problems encountered by the agriculture and food industry and rural communities. We seek to provide our students with opportunities to develop leadership skills, wisdom and independence.

Cooperation

We seek cooperation and partnership with industry representatives, government agencies and other universities and colleges in Canada and around the world.

Accessibility

We strive to make our programs accessible to all.

Community

We are responsible for ensuring a safe, healthy, motivating environment for the entire College community. We also have a commitment to the wider human community to act with equity, charity and responsibility both as an institution and as individuals comprising the institution.

Accountability

We cherish the ideals of academic freedom and individual rights while recognizing the importance of personal and professional integrity and accountability for our actions. We operate in a fiscally responsible manner with all funding groups.

Environmental Responsibility

We seek to act respectfully and responsibly towards the environment and to provide leadership in soil and water conservation.

Respect and Fairness

We are dedicated to our students and to their pursuit of skills and knowledge. We respect all persons without prejudice or discrimination. We respect the opinions of others and encourage open debate. We strive to deal fairly with all people.

SCHEDULE OF DATES

1998

August 17, 1998	Last day for those expecting Masters degrees in October to submit unapproved thesis for examination to Research & Graduate Studies Office.
September 8, 1998	Fall Registration/Orientation.
September 9, 1998	Fall Semester classes begin.
September 14, 1998	Last day for those expecting to receive Masters degrees in October to submit approved unbound copies of thesis to Faculty of Graduate Studies, Dalhousie.
September 22, 1998	Last day to register for a course - Fall semester.
October 12, 1998	Thanksgiving. No classes.
October 23, 1998	Last day to drop a course without academic penalty.
October 28, 1998	Autumn Assembly.
November 11, 1998	Remembrance Day. No classes.
November 20, 1998	Last day to apply for Drop Fail Status.
December 1, 1998	Application to Graduate from Masters program in May due.
December 4, 1998	Last day of classes - Fall Semester.
December 7, 1998	Fall semester examinations begin.
December 15, 1998	Application to Graduate in following May due.
December 17, 1998	Fall semester examinations end.
December 18, 1998	Last day to submit approved unbound copies of thesis to Faculty of Graduate Studies, Dalhousie for those registered in the fall semester only.

1999

January 4, 1999	Winter semester classes begin.
January 15, 1999	Last day to register for a course - Winter semester.
February 19, 1999	Last day to drop a course without academic penalty.
February 22 - 26, 1999	Mid-semester break for individual study.

SECTION HEAD

February 28, 1999	Deadline for Applications to Animal Health Technology program.
March 4, 5, 6, 1999	College Royal. No Classes afternoon of March 5.
March 12, 1999	Last day for those expecting Masters degrees in May to submit unapproved thesis for examination to Research & Graduate Studies Office.
March 19, 1999	Last day to apply for Drop Fail Status.
April 8, 1999	Last day of classes - Winter Semester.
April 9, 1999	Good Friday - No classes.
April 12, 1999	Winter semester examinations begin.
April 13, 1999	Last day for those expecting to receive Masters degrees in May to submit approved unbound copies of thesis to Faculty of Graduate Studies, Dalhousie.
April 22, 1999	Winter semester examinations end.
May 7, 1999	Convocation
June 1, 1999	Last day to cancel residence application - returning students.
June 1, 1999	Deadline for Supplemental Examination fee.
June 8, 1999	Deadline for refund of Supplemental Examination fee (Registrar's Office must be informed in writing).
June 28, 29, 30, 1999	Supplemental Examinations
June 30, 1999	Last day to cancel registration and receive refund. Last day to cancel residence application - new students.

ADMISSIONS INFORMATION

Admissions Status

Full Time: Students are admitted as full-time (three or more courses per semester) students to a program of study if they meet all current admission requirements of that program at the time of application and there is room in the program. The Registrar may admit full-time students on a probationary basis. Full-time students in good standing have the right to move through the program in the normal fashion.

Part Time: Students are admitted as part-time (fewer than three courses per semester) students to a program of study if they meet all the current admission requirements of that program at the time of application and there is room in the program. The Registrar may admit part-time students on a probationary basis. Part-time students in good standing have the right to move through the program in the normal fashion.

Mature: Students who do not meet admission requirements may be admitted as either full time or part time on the basis of being mature applicants as defined in the College Calendar. Mature applicants are considered on a case by case basis, and may be admitted on a probationary basis. Mature students who complete one full semester in good standing assume normal student status.

Visiting: Students are admitted as visiting students on the basis of a letter of permission from another post-secondary institution. Enrolment in specific courses is subject to availability of seats in the course. Visiting students do not have student status beyond the semester to which they are admitted.

Unclassified: Students are admitted to a single course as unclassified upon permission of the Registrar and the Instructor. Unclassified students do not have ongoing student status and may not enroll in more than one course.

No Program: Students may be admitted to one or more courses on a "no program basis". Admission is to specified courses on a case-by-case basis. No program students have no ongoing status.

Foreign: Students who do not have Canadian citizenship or permanent residence in Canada may be admitted as foreign students. Foreign students must produce proof of a student visa before permission to register will be granted.

Admission Procedures

It is the responsibility of each applicant to ensure that the application file is complete. The following must be submitted by each applicant to the Office of the Registrar:

- (a) a completed application form; forms not properly completed will delay processing,
- (b) the application fee of \$25,
- (c) an official record of high school work,
- (d) an official transcript for work done at previous post-secondary institutions (if applicable),
- (e) evidence of competency in English for applicants whose native language is not English (see below),
- (f) supplementary information as required for specific programs.

Response to Applications

NSAC will respond to your application as promptly as possible and will advise you of any documentation still required.

When documentation is complete, applications are placed in the hands of the appropriate admissions committee. Although every effort is made to have decisions made quickly, there will be some delay at times, particularly in programs where competition for places is keen.

As soon as decisions are made, whether admission, deferral or rejection, applicants will be advised.

Please note that admission to many programs is limited. Therefore, possession of minimum requirements does not guarantee admission.

Early Acceptance

Applicants currently attending high school, who have good grades, i.e., a strong average, may be given early acceptance, conditional on satisfactory completion of work for which they are currently enrolled.

Final Acceptance

Applicants must successfully complete high school classes in the required subjects or leave their current post-secondary institution in good standing.

Mature Admission

Students who are at least 23 years of age and who have been out of high school at least 5 years may be considered for admission on a mature student

basis. Such applicants are considered individually. A resume outlining past academic achievements and employment background is required.

Academic Probation

Students may be admitted to NSAC on Academic Probation:

- (a) if the student is a mature student who does not meet admission requirements for the program or
- (b) if the student's last full-time enrolment at any institution has resulted in dismissal or suspension for academic reasons or
- (c) if the student meets most, but not all, of the requirements for admission.

When a student is admitted on probation, all regulations for probationary students apply.

English Language Tests

NSAC accepts minimum TOEFL results of 580.

Application deadlines for ALL programs for fall semester is AUGUST 1 with the following exception:

Animal Health Technology - **February 28**

January Admissions

The deadline for application for January is December 1.

ADMISSION REQUIREMENTS FOR B.Sc. (Agr.), ENGINEERING AND PRE-VETERINARY MEDICINE

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 120, 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 120, 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.**

ADMISSION REQUIREMENTS FOR BACHELOR OF TECHNOLOGY DEGREE (B.Tech)

The B.Tech is a four-year program that will require applicants to have completed a minimum of two years of post-secondary education. In general terms, these two years could be at either the technical or community college level, or at the undergraduate degree level in the arts and/or sciences. However, each specific B.Tech major has specific entrance requirements.

Landscape Horticulture

The Landscape Horticulture major is designed to provide a broad, comprehensive education for those planning a career in the landscape horticulture profession. It will prepare students to work successfully in the diverse landscape industry or create their own businesses within the industry. This major could also lead to graduate study in the area of landscape architecture and related fields.

Years one and two of this program are satisfied by the successful completion of the Landscape Horticulture Technology program or its equivalent with a cumulative average of at least 70 percent. Applicants who meet the general requirements described above (two years post-secondary) may be admitted to the program upon completion of prescribed preparation courses.

ADMISSION REQUIREMENTS FOR TECHNICIAN PROGRAMS

Agricultural Business, Animal Science and Plant Science Technician

High school graduation with three university preparatory courses in English, two in Mathematics, one in Biology and one in Chemistry is required.

Bio-Resources Engineering Technician

High school graduation with pass marks and an average of at least 60% in English, Mathematics, Chemistry, Biology, and one other course, all at the following provincial levels: New Brunswick 120, 121 or 122; Newfoundland Academic 3; Nova Scotia 441 or 442; Prince Edward Island Academic XII.

ADMISSION REQUIREMENTS FOR TECHNOLOGY PROGRAMS

Animal Health Technology

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 120, 121 or 122; Newfoundland Academic 3; Nova Scotia 441 or 442 (if 442, 70% required in Math); Prince Edward Island Academic XII. The selection process includes a full day of interviews and orientation.

Applications will be accepted between January 2 and February 28.

Biology Technology

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 120, 121 or 122; Newfoundland Academic 3; Nova Scotia 441 or 442 (if 442, 70% required in Math); Prince Edward Island Academic XII.

Chemistry Laboratory Technology

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 120, 121 or 122; Newfoundland Academic 3; Nova Scotia 441 or 442 (if 442, 70% required in Math); Prince Edward Island Academic XII.

Food Quality Technology

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 120, 121 or 122; Newfoundland Academic 3; Nova Scotia 441 or 442 (if 442, 70% required in Math); Prince Edward Island Academic XII.

Landscape Horticulture Technology

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 120, 121 or 122; Newfoundland Academic 3; Nova Scotia 441 or 442 (if 442, 70% required in Math); Prince Edward Island Academic XII. Additionally, the applicant must have passed one senior high school Chemistry course. Applicants may be required to attend a selection interview.

Possession of the minimum entrance requirements does not guarantee admission.

TECHNOLOGY PROGRAMS ENTERED FROM TECHNICIAN PROGRAMS

Agricultural Technology

A person with an NSAC Technician Diploma or equivalent may apply to continue studies which would lead to a Diploma of Technology in Agricultural Technology. Courses and projects will be selected to help prepare for the chosen field of agricultural endeavour.

Farming Technology

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

ADMISSION REQUIREMENTS FOR B.Sc.(Agr.) PROGRAM FOR STUDENTS GRADUATING FROM U.S. HIGH SCHOOLS

- a) Students must have achieved a B average in the following five grade 12 courses: English, Pre-calculus Mathematics, Chemistry, Physics* or Biology, one additional university prep course.
- b) Students must have achieved a combined score of at least 1000 in two SAT tests.
- c) Students who are not U.S. Citizens, or whose mother tongue is other than English, may be subject to additional requirements.

*Note: Students who have not completed grade 12 Physics will be required to take a make-up course in Physics.

SCHEDULE OF FEES

You will be billed in September for the fall semester and again in January for the winter semester. Payment is due on September 9, 1998 for the fall semester and for the winter semester on January 4, 1999. Fees not paid by stated deadlines will be subject to interest charges.

TUITION FEES (Canadian Citizens and Permanent Residents)

The College reserves the right to make changes without notice in its published scale of charges for tuition, accommodations and meals, and other fees.

The following rates are those in effect until April 30, 1999:

Program	Price per Course
Degree	\$360
Technician and Technology	\$300
Audit Degree	\$75
Audit Technician and Technology	\$75

For information on Graduate Program Fees, contact the Research & Graduate Studies Office.

TUITION FEES (Non-Canadian Citizens)

Program	Price per Course
Degree	\$670
Technician and Technology	\$670

BOOKS

Full-time students (approximate/year) \$800

OTHER FEES (per semester)

These fees are applicable to students registered in three or more courses in a semester. They are compulsory and non-refundable.

Athletics	\$30
Caution/Development Fund	\$28
Medical Insurance	\$650 ¹
Student Union	\$45
Key Deposit (per year)	\$25

¹For non-Canadian students only. Not necessary upon giving proof of equivalent coverage.

Students may be required to pay specific program related fees not shown in the calendar. These may include fees for items such as laboratory coats, steel-toed boots, hard hats, etc.

Workterm (Practicum) - Fees

Students enrolled in a practicum are regarded as

full-time students. As such, students are eligible for financial assistance.

All practicums are charged the equivalent of at least three course fees.

Caution/Development Fund

Full-time students, at the beginning of each semester, must make a cash deposit of \$28 to cover the cost of damages to College property, breakage in labs, etc.

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 students 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. The balance of monies collected and not required to cover damages/breakages will be placed into funds to support student government; financial assistance; residence development; study abroad and broad-based student development.

Full-time students in the Animal Health Technology program are charged an additional Materials and Service Fee of \$75 per semester. This fee is payable at registration.

For a complete list of supplies and services that are provided to Animal Health Technology students in return for this fee, contact the Department of Animal Science.

Application to Graduate

Students intending to graduate in May **must** submit an "Application to Graduate" to the Registrar by the previous December 15. Students who apply to graduate by November 15 will receive confirmation from the Registrar prior to the start of the winter term. There is no fee charged for an application to graduate submitted by the deadline. Applications which are submitted after December 15 must be accompanied by a \$50 late fee.

Transcript Fee - No transcript fee will be charged.

Supplemental Examination

Each exam.....\$100
(\$50 will be refunded if the student passes.)

REGISTRATION DEPOSIT

All students are required to submit a registration deposit to ensure a place is held for them in their program.

Returning Students Registered for Residence Room Draw.....\$100

Returning students must submit the \$100 Registration Fee before being eligible for the residence room draw. Students should contact the Office of the Dean of Student Services for details about the March room draw.

Returning Students Not Registered for Residence Room Draw\$200

Returning Students must submit the \$200 Registration Fee by June 30 to confirm their registration. Students who do not submit the deposit by June 30 will be removed from all courses and have their Permit to Register revoked. They may reregister for courses by submitting the \$200 fee, but will not be guaranteed enrolment in any class.

The final admission step for new students is to submit the \$200 Registration Fee to the Office of the Registrar. When this deposit is received, the student is granted a Permit to Register, and will receive a package guiding him or her through the Telephone Registration process.

Students who submit written cancellation of their registration by June 30 will be refunded the Registration Deposit. After June 30, the deposit is non-refundable, and is applied to the student's tuition fees, if applicable. No Registration Deposits received after June 30 are refundable.

RESIDENCE DEPOSIT

Returning Students Registered for Residence Room Draw.....\$125

Returning students wishing to take part in the March Room Draw should contact the Office of the Dean of Student Services for details. Students taking part in the room draw must submit the \$100 Registration Fee before their name will be included. Deposits are applied to total residence fees.

The residence deposit will be refunded, up to but not after June 30, for returning students who submit written notice of cancellation by that time. No deposits received after June 30 will be refunded. Failure to cancel a room reservation in writing by August 30 will result in a charge of not less than \$300.

Students who wish to arrive in residence before the official opening date must receive permission from the Residence Manager.

New Students\$190

New students wishing to apply for accommodation in residence should submit the Residence Deposit of \$190 when they submit the Registration Deposit. Deposits are applied to total residence fees.

The residence deposit will be refunded, up to but not after June 30, for new students who submit written notice of cancellation by that time. No deposits received after June 30 will be refunded. Failure to cancel a room reservation in writing by August 30 will result in a charge of not less than \$300.

Students who wish to arrive in residence before the official opening date must receive permission from the Residence Manager.

RESIDENCE AND MEAL PLAN FEES

The following rates are in effect in 1998-99:

Full Year

Plan	Price
Shared room and 19 meals	\$4,302
Shared room and 14 meals	\$4,226
Private room and 19 meals	\$4,738
Private room and 14 meals	\$4,659
Large private and 19 meals	\$5,128
Large private and 14 meals	\$5,050

Please note that students may choose either 19 meals or 14 meals per week. Once the option has been selected no plan changes during the semester are permitted. A change of plan can be made at the end of the fall semester for the winter semester.

House Fee\$30

Laundry Fee\$60

GRADUATE/MATURE STUDENT HOUSING

NSAC is now offering alternative student accommodation at Fundy Residence, AgriTECH Park. AgriTECH Park is located approximately 3.5 km from the main campus. Fundy features apartment-like living with your peer group (of ten) in large, bright, newly renovated rooms. Each section (apartment) includes a fully-equipped kitchen/sitting room with cable TV, microwave, laundry room, storage area and private washrooms and showers.

Prices are \$250 - \$285 (monthly) for private rooms. This includes daily cleaning of common area, parking, garbage removal and utilities. All student rooms are equipped with cable and phone hook-up. Individual hook-ups are the responsibility of the student.

Interested students should contact the Conference Centre Office by writing to NSAC Conference Centre AgriTECH Park, PO Box 550, Truro, NS B2N 5E3 or by calling (902) 893-4145 to find out more about this residence. A security deposit of \$125 accompanied by an application will reserve a room for you in this 29-bed co-educational environment.

TUITION REFUNDS

Refunds for students who withdraw from the College will be as follows:

- Until the end of 10th class day100%
- Until the end of 15th class day80%
- Until the end of 20th class day50%
- Until the end of 25th class day25%
- Beyond 25th class day.....No refund

Room fees are charged from the first day residences officially open. Students who accept a place in residence and fail to cancel their application prior to August 31 or who withdraw from residence will be charged room fees as follows:

- 1st week (or any part thereof) residences are open: \$300
- 2nd week (or any part thereof) residences are open: \$650
- 3rd week (or any part thereof) residences are open: \$1200

From the end of the third week 100% of the room fee for the semester will be charged.

Meal fees are charged on a per week basis for each week or part week prior to the student's official withdrawal from residence.

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 their ID Card to Student Services.

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

NONPAYMENT OF FEES

If fees are owing, you must see the Dean of Student Services, Registrar or the Vice-Principal Administration before registering.

Transcripts will not be issued to students with outstanding accounts.

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.

Application forms are available as follows:

Nova Scotia:

Department of Education & Culture
Box 2290
Halifax Central
Halifax, NS B3J 3C8

New Brunswick:

Department of Advanced Education and Labour
Box 6000
Fredericton, NB E3B 5H1

Prince Edward Island:

Department of Education
Box 2000
Charlottetown, PE C1A 7N8

Newfoundland:

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, the student may take it to the bank to arrange for funds.

CHANGE IN FEE SCHEDULE

The College reserves the right to make changes without notice in its published scale of charges for tuition, accommodations and meals, and other fees.

ACADEMIC ADVISING

The College is committed to providing the student with ready access to qualified academic advisors.

Every student is assigned an advisor upon admission. **The final responsibility for a student's program rests with the student.** The academic advisor is available to assist students in making their choices.

REGULATIONS AND PROCEDURES

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. The Principal has delegated responsibility for student discipline to the Dean of Student Services. College rules with respect to student behaviour and the process for dealing with student discipline are contained in the Community Standards section of the NSAC Student Handbook.

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.

ACADEMIC STANDING

Technical Program

Academic standing is reviewed at the end of each semester. The passing grade 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.

Those students failing two or more courses but fewer than 50% of total courses taken in a semester may be placed on Academic Probation. Students who have been placed on academic probation for the second time in a row may be required to terminate their studies.

The Standards and Admissions Committee may place students on Academic Probation upon appeal of the "Required to Withdraw" status.

Students will be placed on Academic Probation if their last full-time enrolment at any institution has resulted in dismissal for academic reasons.

Bachelor of Technology (B.Tech) Program

Academic standing is reviewed at the end of each semester. The passing grade 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.

A student with a cumulative average below 60% will be placed on Academic Probation.

A student on Academic Probation, who, in the semester following, does not achieve a Semester Grade Average (SGA) of 60 or above, *may* be required to withdraw.

Students returning to studies following a period of a Required to Withdraw Status are automatically on Academic Probation.

Students on Academic Probation are not permitted to register for more than five courses.

Those students failing two or more courses but fewer than 50% of total courses taken in a semester may be placed on Academic Probation. Students who have been placed on academic probation for the second time in a row may be required to terminate their studies.

Bachelor of Science (B.Sc.(Agr.)) and Engineering Program

Academic standing is reviewed at the end of each semester. The passing grade 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.

Full-time students who have cumulative grade averages below the following levels, and who are not required to withdraw, will be on Academic Probation:

Courses Completed	Required Cumulative Grade Average (%)
1-5	50.0
6-10	52.5
11-15	55.0
16-20	57.5
21-40	60.0

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

A student on Academic Probation, who, in the semester following, does not raise his/her cumulative average (CGA) to the minimum level or does not achieve a semester grade average (SGA) of 60 or above, *may* be required to withdraw.

Students returning to studies following a period of a Required to Withdraw Status are automatically on Academic Probation.

Students on Academic Probation are not permitted to register for more than five courses.

REQUIRED TO WITHDRAW - APPEAL POLICY

A. Grounds for Appeal

The following are the only grounds that a student may use for appealing their required to withdraw status:

1. Medically documented/supported personal illness, injury or trauma.
2. Documented/supported severe traumatic circumstances in immediate family such as death or serious illness.

B. Appeal Process Procedures and Deadlines

1. Students must submit a letter requesting their status be appealed to the Chairperson of the Standards and Admissions Committee. The letter should clearly demonstrate that the appeal is in accordance with the Grounds for Appeal in Section A, above. Documentation supporting any claims made must also be included. All information contained in the letter will be kept confidential within the committee.
2. Appeals relating to Fall Semester performance must be received by 4:30 p.m. of the second day

of classes in the following Winter Semester. The committee will meet the following day to consider appeals.

3. Appeals relating to Winter Semester performance must be received by 4:30 p.m. on June 15. The committee will meet during the following week to consider appeals.
4. Students will be informed of the Committee's decision by letter only. All decisions of the Committee are final.

ACADEMIC RESPONSIBILITY

NSAC students are expected to display self-discipline and maturity throughout their period of study at the College. At times there may be considerable pressure to achieve high grades. Some students may be tempted to obtain grades in a dishonest manner. Practices such as cheating, plagiarism and other misrepresentation relating to academic work, compromise the integrity of the College and the degrees and diplomas that the College awards.

The College does not condone these nor other forms of academic misconduct under any circumstances and will take appropriate disciplinary action.

ADVANCED STANDING

Students who have completed courses at other post-secondary institutions may be eligible to receive credit for work done on the following basis:

1. The course (or courses) must be at the same academic level as the one it is replacing.
2. The course (or courses) must satisfy a requirement of the student's academic program.
3. Students enrolled in a four-year degree program must complete a minimum of 15 courses at NSAC to graduate.
4. Students enrolled in Engineering Diploma program must complete a minimum of 11 courses at NSAC to graduate.
5. Students enrolled in a technical diploma program must complete a minimum of one-half of the required courses at NSAC to graduate.

Students may be eligible for advanced credit standing based on the results of an Advanced Placement exam (AP) or an International Baccalaureate certificate (IB). Those wishing to apply for credit at NSAC based on AP or IB must supply an official transcript of test results to the Registrar's office. The student will be notified once

the assessment is complete.

Only credits that are relevant to the student's program will be considered. Transfer credits will be awarded based on equivalent NSAC courses as listed below. Electives may be awarded for credits that have no direct match in the NSAC curriculum. For students with an AP national exam with 4 or 5, or Higher Level IB classes with 5, 6 or 7, the credits below will be awarded upon admission to the B.Sc.(Agr.) Degree. A maximum of five credits may be awarded.

Transfer credits are evaluated on an individual basis and will vary depending on each student's personal academic program. Please consult the Registrar's Office for information concerning your application and transfer credits.

Official transcripts must be submitted to the Registrar's Office before previous post-secondary work will be considered for advanced standing. **Transcripts received after August 15 for the Fall, or December 1 for the Winter, may not be evaluated before Add/Drop deadlines.**

ATHLETICS

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 staff.

ATTENDANCE IN CLASS

All students are expected to attend all lectures and laboratory periods in the courses for which they are registered.

At the discretion of the instructor attendance records may be kept. Instructors may include class attendance in determining the mark for the course. This must be stated at the outset of the class. Specific courses have mandatory attendance requirements. In these courses, attendance requirements will be stated at the outset of the course. Absence from scheduled activities may be considered grounds for automatic failure.

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.

AUDITING COURSES

A student may, with the permission of the Instructor, audit a course. Terms and conditions of the audit will be set forth by the instructor at the outset. Students who do not fulfill the conditions may have their privileges revoked, and will not have the audit recorded on their transcript. Audit students are not entitled to evaluation of their performance.

CHALLENGE FOR CREDIT

Students who have acquired competence in material covered by an NSAC course may obtain credit for the course by means of a course challenge.

Procedures

Application for Challenge for Credit is made to the Registrar. A Challenge for Credit is charged at 50 per cent of the course fee.

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 Department may designate courses that cannot be challenged. 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, the course will appear on the student's transcript indicating a "P" for pass. Challenge for Credit examination failures will not be recorded on the student's transcript.

No student may Challenge for Credit a course which appears on the student's transcript. 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 courses may be accumulated by Challenge for Credit.

A student challenging for credit will be charged 50 percent of the course fee.

STUDENT STATUS

Full-Time

Students who are taking three or more credit courses in a semester, registered in a program, and have ongoing status are full-time students.

Part-Time

Students who are taking fewer than three courses, registered in a program, and have ongoing status are part-time students.

Visiting

Students who are admitted to one or more courses on the basis of a letter of permission from another bona fide post-secondary institution are visiting students. Visiting students do not have ongoing student status. That is, if they wished to enrol for another semester they would be required to go through the application for admission process again.

Unclassified

Students who are admitted to one course only with permission of the Registrar and Instructor, are not registered in a program of study, and do not have ongoing student status are unclassified students.

No Program

Students may be admitted to one or more courses on a "no program" basis. Admission is to specified courses on a case by case basis. No program students do not have ongoing student status. Scholarship students are normally required to be enrolled in four or more courses per semester.

PRINCIPAL'S LIST

The top ten per cent of students within a program of study (Degree, Engineering, Technician, Technology) will be included on the Principal's List. These students must have an average of 80% or higher, have been enrolled in four or more courses and must have no failures (including Drop Failures).

Students who have achieved 80% in the practicum and an average of 80% in the previous semester (four courses minimum) will be considered eligible to be included on the Principal's List.

DROPPING COURSES

Deadline to Drop a Course Without Penalty

The last day to drop a course without academic penalty is 4:30 p.m. on the Friday of the seventh week of classes.

Drop Failure

A Drop Failure in a course is a grade assigned when a student drops the course at the Registrar's Office after "the last day for dropping a course without academic penalty" and not later than the last day permitted for a Drop Fail. A Drop Fail is counted as a failed subject when determining student standings. When determining averages a Drop Fail is not counted as a course (mark). It is recorded on the transcript as a "DF". Courses with "DF" will not be included in determining full-time status.

Deadline for Drop Fail Status

The last day to declare a Drop Fail Status for a course is 4:30 p.m. on the Friday of the 11th week of classes.

If a student is registered for a course after the deadline date indicated for a Drop Fail, the mark earned will be entered on the record regardless of whether or not the examination is written.

EXAMINATIONS

Examination Regulations

1. No student may leave the examination room until one-half hour after the beginning of the examination.

2. No student may be admitted to the examination room after one-half hour of the time allotted for the examination has passed.
3. Foreign language dictionaries, reported to and approved by the examiner, may be used by students whose native language is not English.
4. A student must not communicate with any other student in any manner whatsoever during the examination period.
5. All texts, handbooks, notes, tables, and other printed or written and loose paper must be deposited with the supervisor in charge of the examination, before the student takes his/her seat, unless provision has been made by the examiner for reference books and materials to be allowed.
6. A student who is found guilty of cheating in any manner by the Faculty Council Judicial Committee may receive zero for the course. The Judicial Committee may apply additional penalties including fines, suspensions and/or a permanent notice of academic discipline on the student's transcript.

Rereading of an Examination

A student may consult with the Instructor for information on and interpretation of the evaluation of his/her examination paper. If the student is not satisfied after consultation, he/she may apply to the Registrar's Office for a reread. The application must be submitted within 30 days of the release of the original mark and be accompanied by a \$100 fee. The fee will be returned if the mark is raised, but will be forfeited if it is not. The reread is to be made by an appropriate person outside the Institution and arranged by the Head of the Department concerned.

Supplemental Examination Privilege

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 during the course of the program.

Students who are eligible for a supplemental examination are responsible for contacting the Instructor for information about the method of evaluation and scope of course content to be covered by the examination or other evaluating exercise.

Students must apply in writing to the Registrar's office to write a supplemental examination and must include the fee of \$100 for each supplemental examination by June 2. 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 written 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.

Under no circumstances is a candidate to write a supplemental examination before paying the fee. The supplemental fee will be reimbursed only if the student notifies the Registrar's Office of the decision not to write by June 9.

Special Supplemental Examination

A student in a final year may write one supplemental examination during the week of the winter mid-semester break if the passing of the examination would make the student eligible for graduation. With the exception of the special supplemental examinations for potential graduates, all supplemental examinations are written in June.

Deferred Examinations

A deferred examination is only permitted on extreme compassionate grounds and requires proper certification. Unless the student presents a further certification, each deferred examination must be written within two weeks of the day the regular examination in that course was scheduled. Permission to defer an exam and arrangements for the specific time and place of writing are to be made by the Registrar in conjunction with the Instructor involved.

EXCHANGE PROGRAMS

Students who wish to do a technical exchange program at another institution must have that program approved by the NSAC Technical Curriculum Working Group. The request should be submitted to the working group by the student's program advisor or the Department Head.

Upon approval of the program, the Chair of the Technical Curriculum Working Group will recommend to the Registrar which courses will be replaced in the student's program and which courses must be completed at the host institution.

GRADES**Basis of Marking**

The evaluation of a course may be based on tests, laboratory exercises, other assignments and examinations and attendance. Instructors will take into consideration in determining a final mark the total work of the course. The evaluation used by one Instructor will not necessarily be the one used by another.

At the beginning of each course, professors are required to indicate to students, in writing, the workload for the course, together with the appropriate dates and values of tests, term papers, quizzes, and other assignments, attendance requirements, and the value of final examinations. No credit is given for a course unless all requirements for it have been completed.

Grade Appeals

Wherever possible, the student should resolve differences over assigned grades with the course instructor. After consultation with the Instructor, the student may still wish to appeal the grade. The appeal must be submitted in writing to the Registrar along with the \$25 nonrefundable fee after release of final marks and not later than 30 days after the release of final marks. The Registrar may waive the 30-day deadline in exceptional circumstances.

Appeals of grades will be considered by a committee convened by the Registrar and consisting of the Vice-Principal Academic, the Department Head, the Chair of Standards and Admissions Committee, and one member of Faculty Council selected by the student. In the case where one of the committee members is the Instructor of the course in question, the Vice-Principal Academic shall appoint an alternate. The committee will consider written submissions from the student and the Instructor and may request either to meet with

it. An appeal may be based on questions of process or content. In the case of the latter, any grade changes must be based on a reread. If the committee does not recommend a reread, the student may ask for one. In that case the student must pay a \$100 fee which will be refunded if the resulting grade is higher. Grades resulting from rereads may be higher or lower than the original grade, and are final. The Department Head for the course in question will recommend to the appeals committee an external person or persons who will be selected to conduct the reread. In the case where the Department Head is the Instructor of the course in question, the Vice-Principal Academic shall recommend the external reader to the committee.

All decisions of the grades appeals committee are final. In the case where a grade is changed, the Instructor will be provided with a written explanation for the change.

Release of Final Grades

Official records of grades, transcripts, degrees or diplomas will be withheld pending full payment of all outstanding balances owing to the College.

GRADUATION**Application for Graduation**

Students intending to graduate in May must submit an "Application to Graduate" to the Registrar by the previous December 15. Applications are available at the Registrar's Office.

Late Application for Graduation Fee

Applications to graduate which are submitted after December 15 must be accompanied by a \$50 Late Fee.

Graduation Requirements

Graduands may opt to fulfill the program requirements in place at the time they entered the program or those in place at the time of graduation. The graduand must completely satisfy the syllabus he/she chooses.

In the event that courses are no longer offered, the College will prescribe appropriate substitutes.

ACADEMIC RESIDENCY REQUIREMENTS**B.Sc.(Agr.)**

Students intending to graduate must successfully complete a minimum of 15 semester courses at NSAC including 6 of the last 10 required courses.

B.Tech

Students intending to graduate must successfully complete a minimum of 15 semester courses at NSAC including 6 of the last 10 required courses.

Engineering Diploma

Students intending to graduate with an Engineering Diploma must successfully complete a minimum of 11 courses at NSAC including 6 of the last 10 required courses.

Technical Diploma

Students intending to graduate with a technical diploma must successfully complete a minimum of one-half of the total required courses at NSAC including 7 of the last 12.

Minimum Cumulative Average Requirements for the B.Sc. (Agr.), B.Tech, and B.Eng.

Students are required to have a minimum cumulative average of 60% in all courses required for the program in order to graduate. Courses transferred from other institutions are not normally considered in calculation of cumulative average.

Standing on Graduation

With High Honours:
Cumulative Average of 80% or higher

With Honours:
Cumulative Average of 75-79%

Second Diploma

The minimum requirement for a second Technical Diploma is 12 additional courses that include all the required courses of the syllabus.

HEALTH INSURANCE REQUIREMENTS

Students *not* covered by a Canadian Provincial Health Insurance plan (those who are not Canadian citizen/landed immigrants) are required to arrange for a health insurance policy acceptable to the College. Details and application forms are available from Health Services.

Students who wish to participate in varsity athletics must have health and accident insurance coverage acceptable to the College. Details and application forms are available from the Athletic Department.

Specific programs of study may require additional health and accident coverage.

It is the students' responsibility to ensure they have adequate Health and Accident insurance. The College does not accept any responsibility for costs

related to accident or sickness for students participating in programs of study, athletic or College related events.

The College strongly recommends *all* students obtain additional health and accident insurance above and beyond that available through Provincial Health Plans.

LETTER OF PERMISSION

Students wishing to take a course at another institution for transfer of credit to NSAC must obtain permission in writing from the Registrar in advance.

No courses will be credited towards a student's program which are taken without a letter of permission.

Forms are available at the Registrar's Office.

PLAGIARISM

Copying someone else's work without giving him/her credit is plagiarizing.

The most common form of plagiarism is simply to copy word for word, from a book or article, omitting quotation marks and any mention of the original author.

A slightly more subtle form of plagiarism occurs when a writer's *ideas* are used by someone trying to pass them off as their own. Admittedly, in this second case, *exact words* used by the original writer may not be copied, but the *essence* of what the original writer wrote is. Therefore, it is plagiarism.

The fact that one is not copying from printed, published sources does not absolve one from the charge of plagiarism. One may be justly accused and convicted of it by copying unpublished term papers, essays, assignments, reports (including laboratory reports), and collections.

READMISSION

Former students of NSAC must complete an Application for Admission to be readmitted.

Students who have been required to withdraw from NSAC must apply to the Registrar for readmission. The application for readmission will be considered on an individual basis. Applications must be accompanied by a letter outlining the factors that accounted for poor academic performance and explain why the applicant feels ready to commence studies again.

REGISTRATION**Returning Students**

Returning students will register for fall courses in March. Registration must be confirmed by payment of a \$200 registration deposit by June 1. This fee is applied against the student's fall tuition and will be refunded if the student submits a written notice of withdrawal by June 30.

New Students

New students will receive notice of admission along with a registration package. This package will instruct the student how to register in courses. The registration process is completed by payment of a \$200 registration fee which is applied against fall tuition fees. The \$200 fee will be reimbursed if written notice of withdrawal is forwarded to the Registry by June 30.

Course Registrations

It is the responsibility of the student to ensure that he/she is properly registered in courses. Students will only receive credit for courses in which they are registered by the deadline to add courses. Conversely, a student who does not properly withdraw from a course will receive a mark of "0" for that course and will be responsible for all tuition fees.

Deadlines for adding and dropping courses are strictly enforced.

RESIDENCE

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

TRANSCRIPTS

The following regulation, with regard to transcripts of records, will be in effect:

No transcript will be sent to any other institution, business, etc., without the student's authorization in writing.

PERMISSION TO TAKE COURSES ELSEWHERE

NSAC students wishing to enrol in courses at other institutions for credit in an NSAC program must obtain, in advance, a "Letter of Permission" from the Registrar.

No courses will be credited towards a student's program which are taken without a "Letter of Permission".

"Letter of Permission" forms are at the office of the Registrar.

WITHDRAWAL

Students who withdraw from the College must notify the Registrar's Office in writing.

LATE WITHDRAWAL

Students who withdraw from the College after the last date for declaring a Drop Failure, unless due to illness or other compelling compassionate reasons, will not be admitted the following semester.

STUDENT SAFETY

Students must comply with all safety requirements of the College. This includes safety rules specific to programs and courses.

TELEPHONE REGISTRATION

Undergraduate Degree and Technical diploma students, who have a *Permit to Register*, carry out their registration by means of the Telephone Registration System. Directions and course codes are issued to new and returning students prior to the registration period.

The Telephone Registration System is a computerized facility that is directly connected to the Student Information System (SIS). Changes made over the telephone are instantly effected in SIS. The telephone cannot report to the caller that a change is made until it is complete. Therefore, this is the authoritative source of information on a student's registrations.

Students are responsible for ensuring that their course registration is complete and accurate. Students are academically and financially responsible for each course in which they are registered. If there is any doubt concerning whether a course has been dropped or added, the student should phone the system and use the "List Courses" option from the menu to confirm course enrolments.

Students may be removed from courses for which they do not have prerequisites. Prerequisite waivers can only be granted by the instructors and must be submitted in writing, with the instructor's signature to the Registry.

EXPLANATION OF TERMS AND CODES

Each course is described by a five character code which consists of two alpha and three numeric characters. The two character prefix identifies the department offering the course. The three digits following the prefix describe the level of the course.

Examples:

- 1) AE230 refers to course 230 (Dynamics) offered by the Agricultural Engineering Department.
- 2) H010 refers to course 010 (Technical Writing) offered by the Math, Physics and Humanities Department.

Courses numbered 100 or higher are taken for degree credit courses. Numbers 001 to 099 are offered in Technical programs or as non-degree requirements. Numbers 500+ are offered in the Graduate Program.

Program Codes

BT	Bachelor of Technology (B. Tech)
D	Degree (B. Sc. (Agr.))
E	Engineering
M	Masters
TN	Technician
TY	Technology

Program: Degree (D) Majors

AB	Agricultural Business
AC	Agricultural Chemistry
AM	Agricultural Mechanization
AQ	Aquaculture
AS	Animal Science
BY	AgBiotechnology
EB	Agricultural Economics
EV	Environmental Biology
LH	Landscape Horticulture
PM	Pest Management
PS	Plant Science
PV	Pre-Veterinary
SO	Soil Science
NP	No program, University

Minors

AB	Agricultural Business
AC	Agricultural Chemistry
AG	Agrifood Products
AM	Agricultural Mechanization
EB	Agricultural Economics
EV	Environmental Biology
MH	Mathematics
PM	Pest Management
PS	Plant Science
RS	Rural Studies
SO	Soil Science

Engineering (E)

Majors	
E	Engineering

Technician (TN)

Majors	
AB	Agricultural Business
AS	Animal Science
BE	Bio-Resources Engineering
PS	Plant Science
NP	No program, Technician
OH	Ornamental Horticulture
PS	Plant Science

Specializations

AB	Agricultural Business
AE	Agricultural Engineering
AG	Agronomy
AS	Animal Science
H	Horticulture

Technology (TY) Majors

AH	Animal Health
AT	Agricultural Technology
BT	Biology Technology
CL	Chemistry Laboratory
FL	Food Quality
FT	Farming Technology
LH	Landscape Horticulture

BACHELOR OF TECHNOLOGY

The Bachelor of Technology (B. Tech) is a four-year program designed to provide a comprehensive study of specific areas of technology. Graduates of this program will have mastered a number of skills necessary to address present and future advances in technology associated with specific career paths. A balance of communication and technical skills will be achieved.

All majors in the program have an admission requirement of at least two years of post-secondary studies. The majors are designed to provide advanced studies for NSAC diploma graduates and require many of the elements of these programs as a foundation. Applicants from other post-secondary programs will be assessed and may be required to do some qualifying courses upon admission. Each major has specific entrance requirements, and possession of minimum requirements does not guarantee admission.

BACHELOR OF SCIENCE IN AGRICULTURE AND DEGREE DIPLOMA IN ENGINEERING

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 four-year program in various engineering disciplines, and a two-year pre-veterinary program are also offered.

Students in Engineering at NSAC who successfully complete the prescribed 22 courses and have the required cumulative grade average are granted an Engineering Diploma.

Engineering students who complete the two-year Engineering Diploma program are admitted to the third year in the engineering discipline of their choice at DalTech. Those who elect the Biosystems (Agricultural) or Environmental Engineering disciplines at DalTech which are sponsored jointly by DalTech and NSAC may elect to complete them as co-op programs.

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 (60%), and who are in good standing will be granted the degree of Bachelor of Science in Agriculture, B.Sc.(Agr.).

A high honours diploma will be awarded to 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 Agrologists. 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 Agrologists 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.

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 program meet the formal educational requirements for Professional Agrologists in the provincial Institutes of Agrologists in the Atlantic provinces.

The first academic year (two semesters) of this program is the same for all Majors. Normally, students select a Major before the commencement of the third semester and continue in that field of study until they graduate. Students may also select a Minor to complement the Major, or students can customize their programs by selecting electives that meet personal goals and interests.

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.**

Majors offered at NSAC are:

AgBiotechnology
 Agribiology: Environmental Biology
 Agribiology: Pest Management
 Agricultural Business
 Agricultural Chemistry
 Agricultural Economics
 Agricultural Mechanization
 Animal Science
 Aquaculture
 Plant Science
 Soil Science

Minors offered at NSAC are:

Agribiology: Environmental Biology
 Agribiology: Pest Management
 Agricultural Business
 Agricultural Chemistry
 Agricultural Economics
 Agricultural Mechanization
 Agrifood Products
 Animal Science
 Mathematics
 Plant Science
 Rural Studies
 Soil Science

SYLLABUS

ALL PROGRAMS

Year I

Semester I

B100 Botany
 CS100 Chemical Principles
 EB110* Agricultural Economics (A)
 IN100 Agricultural Ecosystems (A)
 MP100 Calculus & Analytical Geometry I

Semester II

B110 Zoology
 CS110 Organic Chemistry
 EB110* Agricultural Economics (A)
 IN101 Food Security (A)
 MP105 Calculus & Analytical Geometry II

and one of:

H101 The English and American Novel
 H102 Nature in English and American Literature
 H160 Introductory Sociology
 H170 Introductory Human Geography

*EB110: Agricultural Economics is offered in both semesters, and should be alternated with the choice of H101, or H102, or H160 or H170.

College Core Past the First Year (required of all students):

CS200**	Biochemistry I
MP140***	Physics I OR
MP150***	Biophysics I
MP210	Introduction to Statistics
MP222	Computer Methods
XX449****	Project-Seminar I (A)
XX450****	Project-Seminar II (A)

plus two Humanities electives, one of which must be at the 300 or 400 level.

**CS200 is not required for Agricultural Business, Agricultural Economics or Agricultural Mechanization majors.

***MP140 or MP150 is not required for Agricultural Business or Agricultural Economics majors.

****XX449 and XX450 represents the Project-Seminar courses, including EB425. Students may take their Project-Seminar courses from any Department, but the research topic must be approved by the Head of the Department responsible for the major in which they are registered.

Students must complete 12 'A' courses to be awarded the B.Sc.(Agr.). There are five ('A') courses in the College Core (including first year).

Minors must include at least four courses in addition to those required to complete a major. No course can be used to complete the requirements of both a major and a minor, or a minor and a College Core requirement.

AGRIBIOLOGY: ENVIRONMENTAL BIOLOGY

In addition to the College Core, students must take the following courses to meet the requirements of this program:

MAJOR

B200	Cell Biology
B225	Microbiology
B330	Ecology
B350	Ecological Methods
B360	Environmental Analysis
B365	Environmental Impact
B385	Principles of Pest Management (A)
B400	Soil Microbiology (A)
B430	Ecology of Agriculture (A)
CS205	Biochemistry II
CS220	Introduction to Soil Science (A)
MP211	Statistics: Planned Studies, Surveys and Experiments

Electives must include three 'A' courses.

MINOR*

B225	Microbiology
B330	Ecology
CS220	Introduction to Soil Science (A)
B360	Environmental Analysis <i>or</i>
CS305	Instrumental Analytical Chemistry

and two of the following:

B350	Ecological Methods
B365	Environmental Impact
B385	Principles of Pest Management (A)
B400	Soil Microbiology (A)
B430	Ecology of Agriculture (A)
CS457	The Science of Composting and Its Application (A)

*Courses that are already required for a particular major must be replaced with additional courses from the above minor list.

RECOMMENDED SYLLABUS FOR A MAJOR IN AGRIBIOLOGY: ENVIRONMENTAL BIOLOGY

Year 2

Semester III

B200 Cell Biology
 B330 Ecology
 CS200 Biochemistry I
 CS220 Introduction to Soil Science (A)
 MP* or *Elective*

Semester IV

B225 Microbiology
 CS205 Biochemistry II
 MP* or *Elective*
 MP* or *Elective*
 MP* or *Elective*

Year 3

Semester V

B350 Ecological Methods
 B360 Environmental Analysis
 B385 Principles of Pest Management (A)
 MP211 Statistics: Planned Studies, Surveys
 and Experiments
Elective

Semester VI

B365 Environmental Impact
 B449 Project-Seminar I (A)
Elective
Elective
Elective

Year 4

Semester VII

B400 Soil Microbiology (A)
Elective
Elective
Elective
Elective

Semester VIII

B430 Ecology of Agriculture (A)
 B450 Project Seminar II (A)
Elective
Elective
Elective

MP* - Students must complete the combination of MP140 or MP150 and MP210 in Semester III & IV. If MP140/MP150 is done in Semester III then MP210 will be done in Semester IV. If MP210 is done in Semester III, then MP140/MP150 will be done in Semester IV.

MP222 should be completed in either Semester III or IV.

MP210 is a prerequisite to MP211.

Electives must include two Humanities courses, one of which must be at the 300 or 400 level, and three 'A' courses.

AGRIBIOLOGY: PEST MANAGEMENT

In addition to the College Core, students must take the following courses to meet the requirements of this program:

MAJOR

B200	Cell Biology
B225	Microbiology
B300	Principles of Plant Pathology (A)
B320	General Entomology
B330	Ecology
B335	Weed Science (A)
B406	Economic Plant Pathology (A)
B425	Economic Entomology (A)
B445	Applied Weed Science (A)
CS205	Biochemistry II
CS220	Introduction to Soil Science (A)
MP211	Statistics: Planned Studies, Surveys and Experiments

Electives must include one 'A' course.

MINOR*

B225	Microbiology
------	--------------

and two of the following pairs of courses (a total of four courses)**:

B300	Principles of Plant Pathology (A) <i>and</i>
B406	Economic Plant Pathology (A)
B320	General Entomology <i>and</i>
B425	Economic Entomology (A)
B335	Weed Science (A) <i>and</i>
B445	Applied Weed Science (A)

* If not required as part of a major.

** For each of B300, B320, and B335 already taken as part of the major, substitute another course from this list.

RECOMMENDED SYLLABUS FOR A MAJOR IN AGRIBIOLOGY: PEST MANAGEMENT

Year 2

Semester III

B200 Cell Biology
 B330 Ecology
 CS200 Biochemistry I
 CS220 Introduction to Soil Science (A)
 MP* or *Elective*

Semester IV

B225 Microbiology
 CS205 Biochemistry II
 MP* or *Elective*
 MP* or *Elective*
 MP* or *Elective*

Year 3

Semester V

B300 Principles of Plant Pathology (A)
 B320 General Entomology
 B335 Weed Science (A)
 MP211 Statistics: Planned Studies,
 Surveys and Experiments
Elective

Semester VI

B406 Economic Plant Pathology (A)
 B425 Economic Entomology (A)
 B445 Applied Weed Science (A)
 B449 Project-Seminar I (A)
Elective

Year 4

Semester VII

Elective
Elective
Elective
Elective
Elective

Semester VIII

B450 Project-Seminar II (A)
Elective
Elective
Elective
Elective

MP* - Students must complete the combination of MP140 or MP150 and MP210 in Semester III & IV. If MP140/MP150 is done in Semester III then MP210 will be done in Semester IV. If MP210 is done in Semester III, then MP140/MP150 will be done in Semester IV.

MP222 should be completed in either Semester III or IV.

MP210 is a prerequisite to MP211.

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

AGRICULTURAL BIOTECHNOLOGY (Subject to availability of funding)

In addition to the College Core, students must take the following courses to meet the requirements of this program:

MAJOR

- AS310 Animal Breeding (A) *or* PS400 Plant Breeding (A)
- AS465 Molecular Applications to Animal Production (A)
- B201 Cell Biology Laboratory
- B225 Microbiology
- B240 Genetics I
- B370 An Introduction to Molecular Genetics
- CS205 Biochemistry II
- IN390 Microbial Biotechnology
- IN395 Applied Biochemistry
- IN397 Advanced Biochemisry
- IN475 Biotechnology in Agriculture (A)
- PS475 Plant Biotechnology (A) *or* AS470 Animal Cell Culture (A)

RECOMMENDED SYLLABUS FOR A MAJOR IN AGRICULTURAL BIOTECHNOLOGY

(Subject to availability of funding)

Year 2

Semester III

- B201 Cell Biology Laboratory
- B240 Genetics I
- CS200 Biochemistry I
- MP210 Introduction to Statistics
- MP222 Computer Methods

Semester IV

- B225 Microbiology
- B370 An Introduction to Molecular Genetics
- CS205 Biochemistry II
- MP140* Physics I
- Elective*

Year 3

Semester V

- AS310 Animal Breeding (A) *or*
*Elective***
- AS465 Molecular Applied Animal Prod.(B)
- IN390 Microbial Biotechnology
- IN395 Applied Biochemistry
Elective
Elective

Semester VI

- IN375 Advanced Biochemistry
- IN449* Agricultural Biotechnology Project-Seminar I
- PS400 Plant Breeding *or*
*Elective***
- PS475 Plant Biotechnology (A)
- AS470 Animal Cell Culture (A)

Summer A semester practicum/co-op placement could be combined with IN449/450 project-seminar.

Year 4

Semester VII

- Elective*
- Elective*
- Elective*
- Elective*
- Elective*

Semester VIII

- IN450 Agricultural Biotechnology Project-Seminar II
- IN475 Biotechnology in Agriculture
Elective
Elective
Elective

* MP140 or MP150

** Either AS310 or PS400 must be taken.

*** Semester VII may be taken at NSAC or at another institution.

Electives must include two Humanities courses at 300 or 400 level. A total to 12 "A" courses are required, which means that three electives must be "A".

AGRICULTURAL BUSINESS

In addition to the College Core, students must take the following courses to meet the requirements of this program:

MAJOR

EB200	Microeconomics I
EB210	Financial Accounting I
EB215	Financial Accounting II
EB255	Macroeconomics I
EB260	Mathematical Economics
EB315	Management Accounting
EB320	Agricultural and Food Policy (A)
EB325	Operations Research
EB335	Business Marketing
EB340	Farm Management I (A)
EB410	Strategic Management in Agri-Business (A)
EB445	Agribusiness Entrepreneurship (A)
EB205	Microeconomics II
	<i>or</i>
EB220	Production Economics (A)
MP211	Statistics: Planned Studies, Surveys and Experiments

Electives must include three 'A' courses (or two 'A' courses if EB220 is selected instead of EB205).

MINOR*

EB210	Financial Accounting I
EB335	Business Marketing
EB340	Farm Management I (A)

and three of:

EB215	Financial Accounting II
EB221**	Topics in Economics & Business Management (A)
EB255	Macroeconomics I
EB305	Macroeconomics II
EB315	Management Accounting
EB320	Agricultural & Food Policy I (A)
EB410	Strategic Management in Agri-Business (A)
EB415	Business Law
EB421**	Special Topics in Agricultural Economics & Business I (A)
EB422**	Special Topics in Agricultural Economics & Business II (A)
EB430	International Marketing
EB435	Consumer Behaviour and Food Marketing (A)
EB440	Farm Management II (A)
EB445	Agribusiness Entrepreneurship (A)

*Courses that are already required for a particular major must be replaced with additional courses from the above minor list.

** Topics must relate to agricultural economics

RECOMMENDED SYLLABUS FOR A MAJOR IN AGRICULTURAL BUSINESS

Year 2	
<i>Semester III</i>	<i>Semester IV</i>
EB200 Microeconomics I	EB205 Microeconomics II or
EB210 Financial Accounting I	EB220 Production Economics (A)
EB260 Mathematical Economics	EB215 Financial Accounting II
MP* or <i>Elective</i>	EB255 Macroeconomics I
MP* or <i>Elective</i>	MP* or <i>Elective</i>
	MP* or <i>Elective</i>
Year 3	
<i>Semester V</i>	<i>Semester VI</i>
EB315 Management Accounting (A)	EB320 Agricultural & Food Policy I
EB335 Business Marketing (A)	EB325 Operations Research
EB340 Farm Management I (A)	<i>Elective</i>
MP211 Statistics: Planned Studies, Surveys & Experiments	<i>Elective</i>
<i>Elective</i>	<i>Elective</i>
Year 4	
<i>Semester VII</i>	<i>Semester VIII</i>
EB410 Strategic Management in Agri-business (A)	EB445 Agribusiness Entrepreneurship (A)
EB425 Research Methods (A)	EB450 Project-Seminar (A)
<i>Elective</i>	<i>Elective</i>
<i>Elective</i>	<i>Elective</i>
<i>Elective</i>	<i>Elective</i>

MP* - MP210 and MP222 should be completed in semesters III or IV.
 Electives must include two Humanities courses, one of which must be at the 300 or 400 level, and three 'A' courses (two 'A' courses if EB220 is selected instead of EB205).

AGRICULTURAL CHEMISTRY

In addition to the College Core, students must take the following courses to meet the requirements of this program:

MAJOR

B225	Microbiology
CS205	Biochemistry
CS210	Advanced General Chemistry
CS215	Advanced Organic Chemistry
CS220	Introduction to Soil Science (A)
CS225	Quantitative Analytical Chemistry
CS300	Physical Chemistry
CS305	Instrumental Analytical Chemistry
CS350	Food Chemistry (A)
CS370	Instrumental Food Analysis
CS440	Environmental Soil Chemistry

Electives must include five 'A' courses.

MINOR

CS200*	Biochemistry I
CS210*	Advanced General Chemistry <i>or</i> CS215*Advanced Organic Chemistry

and any three of the following not required as part of a major:

B225	Microbiology
CS205	Biochemistry II
CS210	Advanced General Chemistry
CS215	Advanced Organic Chemistry
CS225	Quantitative Analytical Chemistry
CS300	Physical Chemistry
CS305	Instrumental Analytical Chemistry
CS310	Radiotracers in Agriculture (A)
CS350	Food Chemistry (A)
CS351	Food Chemistry (A)
CS370	Instrumental Food Analysis
CS415**	Special Topics in Chemistry and Soil Science I (A)
CS425**	Special Topics in Chemistry and Soil Science II (A)

*If not required as part of a major.

**The course content must be in the area of Agricultural Chemistry.

RECOMMENDED SYLLABUS FOR A MAJOR IN AGRICULTURAL CHEMISTRY

Year 2

Semester III

CS200 Biochemistry I
 CS210¹ Advanced General Chemistry or
 CS215¹ Advanced Organic Chemistry
 CS220 Introduction to Soil Science (A)
 MP* or *Elective*
 MP* or *Elective*

Semester IV

CS205 Biochemistry
 CS225 Quantitative Analytical Chemistry
 MP* or *Elective*
 MP* or *Elective*
 MP* or *Elective*

Year 3

Semester V

CS210¹ Advanced General Chemistry or
 CS215¹ Advanced Organic Chemistry
 CS300¹ Physical Chemistry or
Elective
 CS305 Instrumental Analytical Chemistry
Elective
Elective

Semester VI

B225 Microbiology
 CS350 Food Chemistry (A)
 CS440 Environmental Soil Chemistry or
Elective
Elective
Elective

Year 4

Semester VII

CS300¹ Physical Chemistry or
Elective
 CS449 Project-Seminar I (A)
Elective
Elective
Elective

Semester VIII

CS370 Instrumental Food Analysis
 CS440¹ Environmental Soil Chemistry or
Elective
 CS450 Project-Seminar II (A)
Elective
Elective

¹These courses are offered in alternate years.

MP* - Students must complete the combination of MP140 or MP150 and MP210 in Semester III & IV. If MP140/MP150 is done in Semester III then MP210 will be done in Semester IV. If MP210 is done in Semester III, then MP140/MP150 will be done in Semester IV.

MP222 should be completed in either Semester III or IV.

Electives must include two Humanities courses, one of which must be at the 300 or 400 level, and five 'A' courses.

AGRICULTURAL ECONOMICS

In addition to the College Core, students must take the following courses to meet the requirements of this program:

MAJOR

EB200	Microeconomics I
EB205	Microeconomics II
EB210	Financial Accounting I
EB255	Macroeconomics I
EB260	Mathematical Economics
EB305	Macroeconomics II
EB320	Agricultural and Food Policy I (A)
EB325	Operations Research
EB330	Agricultural Markets and Prices (A)
EB335	Business Marketing
EB340	Farm Management I (A)
EB360	Econometrics
EB419	Agrifood Policy Analysis (A)

Electives must include four 'A' courses.

MINOR*

EB200	Microeconomics I
EB205	Microeconomics II
EB260	Mathematical Economics

and three of the following:

EB220	Production Economics (A)
EB221**	Topics in Economics & Business Management (A)
EB255	Macroeconomics I
EB305	Macroeconomics II
EB320	Agricultural and Food Policy I (A)
EB325	Operations Research
EB330	Agricultural Markets and Prices (A)
EB340	Farm Management I (A)
EB360	Econometrics
EB400	Resource and Environmental Economics
EB421**	Special Topics in Agricultural Economics & Business I (A)
EB422**	Special Topics in Agricultural Economics & Business II (A)
EB440	Farm Management II (A)

*Courses that are already required for a particular major must be replaced with additional courses from the above minor list.

** Topics must relate to agricultural economics.

RECOMMENDED SYLLABUS FOR A MAJOR IN AGRICULTURAL ECONOMICS

Year 2

Semester III

EB200 Microeconomics I
 EB210 Financial Accounting I
 EB260 Mathematical Economics
 MP* or *Elective*
 MP* or *Elective*

Semester IV

EB205 Microeconomics II
 EB255 Macroeconomics I
 MP* or *Elective*
 MP* or *Elective*
Elective

Year 3

Semester V

EB305 Macroeconomics II
 EB335 Business Marketing
 EB340 Farm Management I (A)
 EB360 Econometrics
Elective

Semester VI

EB320 Agricultural and Food Policy I (A)
 EB325 Operations Research
 EB330 Agricultural Markets & Prices (A)
Elective
Elective

Year 4

Semester VII

EB419 Agrifood Policy Analysis
 EB425 Research Methods (A)
Elective
Elective
Elective

Semester VIII

EB450 Project-Seminar (A)
Elective
Elective
Elective
Elective

MP* - MP210 and MP222 should be completed in semester III or IV. MP210 is a prerequisite to EB360.

Electives must include two Humanities courses, one of which must be at the 300 or 400 level, and four 'A' courses.

AGRICULTURAL MECHANIZATION

In addition to the College Core, students must take the following courses to meet the requirements of this program:

MAJOR

AE102	Design and Graphics
AE120	Properties and Mechanics of Materials
AE135	Fundamentals of Food Processing (A)
AE200	Environmental Impacts and Resource Management (A)
AE305	Engineering Measurements and Controls
AE320	Structures and Their Environment (A)
AE335	Materials Handling and Processing (A)
AE340	Soil and Water (A)
AE355	Principles of Agricultural Machinery (A)
AE410	Water and Water Quality Management (A)
AE420	Management of Mechanized Agricultural Systems (A)
EB210	Financial Accounting I
EB340	Farm Management I (A)

MINOR

A minimum of **four** courses consisting of:

AE120 Properties and Mechanics of Materials

and at least one of:

AE320 Structures and Their Environment (A)
 AE340 Soil and Water (A)
 AE355 Principles of Agricultural Machinery (A)

and other electives from the following as required:

AE102 Design and Graphics
 AE135 Fundamentals of Food Processing (A)
 AE215 Aquatic Environment (A)
 AE200 Environmental Impacts and Resource Management (A)
 AE305 Engineering Measurements and Controls
 AE335 Materials Handling and Processing (A)
 AE360 Aquatic Engineering (A)
 AE410 Water and Water Quality Management (A)
 AE420 Management of Mechanized Agricultural Systems (A)

RECOMMENDED SYLLABUS FOR A MAJOR IN AGRICULTURAL MECHANIZATION

Year 2

Semester III

EB210 Financial Accounting
Elective
 MP* or *Elective*
 MP* or *Elective*
 MP* or *Elective*

Semester IV

AE102 Design and Graphics
 AE120 Properties and Mechanics of
 Materials
 MP* or *Elective*
 MP* or *Elective*
 MP* or *Elective*

Year 3

Semester V

AE320 Structures and Their
 Environment (A)
 AE335 Materials Handling and
 Processing (A)
 AE340 Soil and Water (A)
 AE355 Principles of Agricultural Machinery
Elective

Semester VI

AE135 Fundamentals of Food
 Processing (A)
 AE305 Engineering Measurements and
 Controls
 AE449 Project-Seminar (A)
Elective
Elective

Year 4

Semester VII

AE200 Environmental Impacts and
 Resource Management (A)
 AE450 Project-Seminar II (A)
 EB340 Farm Management I (A)
Elective
Elective

Semester VIII

AE410 Water and Water Quality Management
 AE420 Management of Mechanized
 Agricultural Systems (A)
Elective
Elective
Elective

MP* - Students must complete the combination of MP140 or MP150 and MP210 in Semester III & IV. If MP140/MP150 is done in Semester III then MP210 will be done in Semester IV. If MP210 is done in Semester III, then MP140/MP150 will be done in Semester IV.

MP222 should be completed in either Semester III or IV.

Electives must include two Humanities courses, one of which must be at the 300 or 400 level

AGRIFOOD PRODUCTS

MINOR*

B225	Microbiology
B355	Food Microbiology
CS200	Biochemistry I
CS350	Food Chemistry (A) <i>or</i>
CS351	Food Chemistry (A)
CS380	Food Quality Assurance
EB335	Business Marketing

*Courses that are already required for a particular major must be replaced with additional courses from the following list:

AE135	Fundamentals of Food Engineering (A)
AS345	Eggs and Dairy Products (A)
AS350	Meat Science (A)
EB320	Agriculture and Food Policy I (A)
EB430	International Marketing
EB435	Consumer Behaviour and Food Marketing (A)
PS200	Vegetable Crops (A)
PS210	Principles of Organic Horticultural Crop Production (A)
PS305	Grain Production (A)
PS315	Tree Fruit Crops (A)
PS320	Small Fruit Crops (A)
PS325	Potato Production (A)

ANIMAL SCIENCE

In addition to the College core, students must take the following courses to meet the requirements of this program:

AS200	Animal Agriculture I (A)
AS201	Animal Agriculture II (A)
AS230	Farm Animal Physiology
AS305	Animal Nutrition
AS310	Animal Breeding (A)
AS330	Growth, Reproduction, Lactation (A)
B240	Genetics I

plus

Two Animal Science courses at the 300 or 400 level

One Animal Science course at the 400 level (AS449 and AS450 cannot be used)

(Three of these must be 'A' courses)

MINOR

Any six courses approved by the Animal Science Department. The content of the minor will be decided on a student-by-student basis.

RECOMMENDED SYLLABUS FOR A MAJOR IN ANIMAL SCIENCE

Year 2

Semester III

AS200	Animal Agriculture I (A)
B240	Genetics I
CS200	Biochemistry I
	MP* or Elective
	Elective

Semester IV

AS201	Animal Agriculture II (A)
AS230	Farm Animal Physiology
MP222	Computer Methods
	MP* or Elective
	MP* or Elective

Year 3

Semester V

AS305	Animal Nutrition
AS310	Animal Breeding (A)
AS330	Growth, Reproduction & Lactation (A)
	Elective
	Elective

Semester VI

Elective
Elective
Elective
Elective
Elective

Year 4

Semester VII

AS449	Project-Seminar I (A)
	Elective
	Elective
	Elective
	Elective

Semester VIII

AS450	Project-Seminar II (A)
	Elective
	Elective
	Elective
	Elective

MP* - Students must complete the combination of MP140 or MP150 and MP210 in Semester III & IV. If MP140/MP150 is done in Semester III then MP210 will be done in Semester IV. If MP210 is done in Semester III, then MP140/MP150 will be done in Semester IV.

MP222 should be completed in either Semester III or IV.

Electives must include two Humanities courses, one of which must be at the 300 or 400 level, two 300 or 400 level Animal Science courses and one 400 level Animal Science course (three of these must be 'A' courses).

AQUACULTURE

In addition to the College Core, students must take the following courses to meet the requirements of this program:

MAJOR

- AE215 Aquatic Environment (A)
- AE360 Aquatic Engineering (A)
- AS210 Introduction to Aquaculture (A)
- AS305 Animal Nutrition
- AS310 Animal Breeding (A)
- AS375 Aquatic Ecology
- AS380 Physiology of Aquatic Animals (A)
- B225 Microbiology
- B240 Genetics I
- EB340 Farm Management (A)

and one of:

- EB210 Financial Accounting
- EB335 Business Marketing
- EB440 Farm Management II (A)

Electives must include one 'A' course, none if EB440 is taken.

RECOMMENDED SYLLABUS FOR A MAJOR IN AQUACULTURE

Year 2

Semester III

AS210 Introduction to Aquaculture (A)
 B240 Genetics I
 CS200 Biochemistry I
 MP* or *Elective*
 MP* or *Elective*

Semester IV

AE215 Aquatic Environment (A)
 B225 Microbiology
 MP* or *Elective*
 MP* or *Elective*
 MP* or *Elective*

Year 3

Semester V

AS305 Animal Nutrition
 AS310 Animal Breeding (A)
 AS375 Aquatic Ecology
 AS380 Physiology of Aquatic Animals (A)
 EB340 Farm Management I (A)

Semester VI

AE360 Aquatic Engineering (A)
Elective
Elective
Elective
Elective

Year 4

Semester VII

AS449 Project-Seminar (A)
Elective
Elective
Elective
Elective

Semester VIII

AS450 Project-Seminar (A)
Elective
Elective
Elective
Elective

MP* - Students must complete the combination of MP140 or MP150 and MP210 in Semester III & IV. If MP140/MP150 is done in Semester III then MP210 will be done in Semester IV. If MP210 is done in Semester III, then MP140/MP150 will be done in Semester IV.

MP222 should be completed in either Semester III or IV.

Electives must include two Humanities courses, one of which must be at the 300 or 400 level, and one additional 'A' course unless EB440 is taken and one of EB210, EB335 or EB440.

MATHEMATICS

MINOR

MP420 Agricultural Modelling

Plus any three Mathematics and Physics* courses that have not already been taken as part of either the College core or a Major.

* Mathematics-oriented courses offered by other Departments may be substituted with permission of the Head of the Department of Mathematics, and Humanities.

PLANT SCIENCE

In addition to the College Core, students must take the following courses to meet the requirements of this program:

MAJOR

B240 Genetics I
 B260 Plant Physiology
 B265 Systematic Botany
 B300 Principles of Plant Pathology (A)
 B320 General Entomology
 B335 Weed Science (A)
 CS220 Introduction to Soil Science (A)
 PS415 Crop Adaptation (A)

plus

Two Plant Science Production Courses
 One Plant Science (PS) *Elective* Course
 One of PS405 Agronomy (A) or PS410 Horticulture (A)
Electives must include two 'A' courses.

MINOR

Any **five** Plant Science Courses*

* Plant Science courses required for a given major cannot also be counted towards the Plant Science minor; a major in Plant Science cannot be combined with a minor in Plant Science.

RECOMMENDED SYLLABUS

Year 2

Semester III

B240 Genetics I
 B265 Systematic Botany
 CS200 Biochemistry I
 CS220 Introduction to Soil Science (A)
 MP* or *Elective*

Semester IV

B260 Plant Physiology
 MP* or *Elective*
 MP* or *Elective*
 MP* or *Elective*
Elective

Year 3

Semester V

B300 Principles of Plant Pathology (A)
 B320 General Entomology
 B335 Weed Science (A)
 Elective
 Elective

Semester VI

PS449 Project-Seminar (A)
 Elective
 Elective
 Elective
 Elective

Year 4

Semester VII

PS415 Crop Adaptation (A)
 PS450 Project-Seminar II (A)
 Elective
 Elective
 Elective
 Elective

Semester VIII

PS405 Agronomy (A) or
 PS410 Horticulture (A)
 Elective
 Elective
 Elective

MP* - Students must complete the combination of MP140 or MP150 and MP210 in Semester III & IV. If MP140/MP150 is done in Semester III then MP210 will be done in Semester IV. If MP210 is done in Semester III, then MP140/MP150 will be done in Semester IV.

MP222 should be completed in either Semester III or IV.

Electives must include two Humanities courses, one of which must be at the 300 or 400 level, two Plant Science Production courses and one additional Plant Science course. (Two of the electives must be 'A' courses.)

RURAL STUDIES

MINOR*

Any four of the following:

- H320 Extension Education in the Rural Community
- H325 Technology in Agricultural Communications
- H350 Environmental and Agricultural Ethics
- H360 Rural Sociology
- H370 Rural Geography
- H401 Humanities Research Seminar I
- H402 Humanities Research Seminar II

* Courses chosen cannot be counted towards both this minor and the College Core, which requires one Humanities course at the 300 or 400 level.

SOIL SCIENCE

In addition to the College Core, students must take the following courses to meet the requirements of this program:

MAJOR

AE340	Soil and Water (A)
B225	Microbiology
B260	Plant Physiology
B400	Soil Microbiology (A)
CS220	Introduction to Soil Science (A)
CS225	Quantitative Analytical Chemistry
CS230	Introduction to Geology
CS320	Soil Fertility (A)
CS325	Soil Genesis and Classification (A)
CS335	Soil Physics (A)
CS345	Soil Conservation in Agriculture (A) <i>or</i>
CS430	Soil Survey and Land Evaluation (A)
CS440	Environmental Soil Chemistry

No additional 'A' courses are required.

MINOR

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

and any four of the following not required as part of a major:

AE340	Soil and Water (A)
B400	Soil Microbiology (A)
CS320	Soil Fertility (A)
CS325	Soil Genesis and Classification (A)
CS335	Soil Physics (A)
CS345	Soil Conservation in Agriculture (A)
CS415	Special Topics in Chemistry and Soil Science I (A)
CS430	Soil Survey and Land Evaluation (A)
CS440	Environmental Soil Chemistry

or any other Soil Science course approved by the Chemistry and Soil Science Department.

*If not required as part of a major.

RECOMMENDED SYLLABUS FOR A MAJOR IN SOIL SCIENCE

Year 2

Semester III

- CS200 Biochemistry I
- CS220 Introduction to Soil Science (A)
MP* or *Elective*
MP* or *Elective*
MP* or *Elective*
MP* or *Elective*

Semester IV

- B225 Microbiology
- B260 Plant Physiology
- CS225 Quantitative Analytical Chemistry
MP* or *Elective*

Year 3

Semester V

- AE340 Soil and Water (A)
- CS325¹ Soil Genesis and Classification or *Elective*
- CS345 Soil Conservation in Agriculture (A) or
- CS430 Soil Survey and Land Evaluation (A)
Elective
Elective

Semester VI

- CS230 Introduction to Geology
- CS320 Soil Fertility (A)
- CS335¹ Soil Physics (A) or
- CS440¹ Environmental Soil Chemistry
Elective
Elective

Year 4

Semester VII

- B400 Soil Microbiology (A)
- CS325¹ Soil Genesis and Classification (A)
or *Elective*
- CS449 Project-Seminar I (A)
Elective
Elective

Semester VIII

- CS335¹ Soil Physics (A) or
- CS440¹ Environmental Soil Chemistry
- CS450 Project-Seminar II (A)
Elective
Elective
Elective

¹These courses are offered in alternate years.

MP* - Students must complete the combination of MP140 or MP150 and MP210 in Semester III & IV. If MP140/MP150 is done in Semester III then MP210 will be done in Semester IV. If MP210 is done in Semester III, then MP140/MP150 will be done in Semester IV.

MP222 should be completed in either Semester III or IV.

Electives must include two Humanities courses, one of which must be at the 300 or 400 level.

ENGINEERING DIPLOMA

The Engineering Diploma program is the 22-course Associate Universities program given in conjunction with DalTech (formerly the Technical University of Nova Scotia, TUNS). Students who successfully complete this program at NSAC receive an Engineering Diploma.

As DalTech, Dalhousie University and the Associated Universities (AU's) form a unified system of engineering education, all diploma graduates from the AU's are guaranteed admission to DalTech. Students at the AU's and at Dalhousie will normally apply to disciplines at DalTech at the end of their first year in engineering since some discipline-specific courses are required in year two. They will be granted placeholder status on the basis of their averages and the availability of seats in the discipline. These placeholders will assure continuance if the standards for promotion are met by the student at the AU in year 2. Placeholders are valid for one year, although holders may reapply. Students are free to apply for transfer to Dalhousie at anytime on a course-by-course basis - this is an important consideration for those requiring discipline-specific courses not offered at a particular Associated University.

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:

- (a) all courses specified in the syllabus of courses
- (b) at least 22 semester courses
- (c) at least 11 courses at NSAC, including 6 of the last 10 required courses

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

SYLLABUS

Year I

Semester I

AE110	Statics
CS100	Chemical Principles I
H102	Nature in English and American Literature
MP100	Calculus & Analytical Geometry I
MP140	Physics I

Semester II

AE102	Design & Graphics
CS110	Organic Chemistry
EB110	Agricultural Economics
MP105	Calculus & Analytical Geometry II
MP145	Physics II

Year 2

Semester III

AE300	Electric Circuits
AE310	Thermodynamics
MP220	Computer Science
MP230	Multivariable Calculus
	<i>Discipline Specific</i>
	<i>Discipline Specific</i>

Semester IV

MP212	Probability & Statistics for Engineering
MP236	Differential Equations
	<i>Discipline Specific</i>
	<i>Discipline Specific</i>
	<i>Discipline Specific</i>
	<i>Discipline Specific</i>

Note: The following *Discipline Specific* courses are required for each engineering discipline:

Engineering Diploma Program - Required Discipline-Elective Courses

Semester III

Biosystems (Agricultural)	Environmental	Chemical	Civil	Electrical	Industrial	Mechanical	Metallurgical	Mining
AE315 Strength of Materials	H160 Introductory Sociology	AE200 Environmental Impacts & Resource Mgt	AE315 Strength of Materials	N/A	AE315 Strength of Materials	AE315 Strength of Materials	AE315 Strength of Materials	AE315 Strength of Materials
B100 Botany	B100 Botany	Humanities *	Humanities *	N/A	Humanities *	Humanities *	Humanities *	Humanities *

Semester IV

Biosystems (Agri-cultural)	Environmental	Chemical	Civil	Electrical	Industrial	Mechanical	Metallurgical	Mining
AE230 Dynamics	B225 Microbiology	N/A	AE230 Dynamics	N/A	AE230 Dynamics	AE230 Dynamics	AE230 Dynamics or AE230 AE206 Design Project	AE230 Dynamics
AE350 Fluid Mechanics	AE350 Fluid Mechanics	AE350 Fluid Mechanics	AE350 Fluid Mechanics	N/A	AE350 Fluid Mechanics	AE350 Fluid Mechanics	AE350 Fluid Mechanics	
AE380 Engineering Economy	CS230 Geology	N/A	AE380 Engineering Economy	AE380 Engineering Economy	AE380 Engineering Economy	AE380 Engineering Economy	AE380 Engineering Economy	AE380 Engineering Economy
B110 Zoology	B110 Zoology	Humanities *	Humanities *	Humanities *	Humanities *	AE206 Design Project	Humanities *	Humanities *

* Any Humanities course excluding H130, H135 and H136

NOTE: One of H113 or H325 must be completed in the fall or winter semester

N/A - Required course is not available at NSAC and must be completed at DalTech

Biosystems (Agricultural) Engineering and Environmental Engineering

These two disciplines of engineering are taught and administered jointly by the Agricultural Engineering Dept. of NSAC and the Biological Engineering Dept. of DalTech. They are both co-operative programs but unlike programs of other engineering disciplines, they are based on both biological as well as engineering science principles. This makes it convenient for students to transfer after year one of the BSc(Agr) program into year two of these engineering programs.

Students in these disciplines who complete the two year engineering diploma enter DalTech in year three and can then return to NSAC in semester VII to study specialized Agricultural Engineering, Agricultural and Environmental Science courses.

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

PRE-VETERINARY MEDICINE

Students prepare to enter the program leading to a 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 application 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.

RECOMMENDED SYLLABUS

Year 1			
<i>Semester I</i>			<i>Semester II</i>
B100	Botany	B110	Zoology
CS100	Chemical Principles	CS110	Organic Chemistry
IN100	Agricultural Ecosystems*	IN101	Food Security*
H113	Composition	EB110	Agricultural Economics*
MP100	Calculus & Analytic Geometry I	MP105	Calculus & Analytic Geometry II*
Year 2			
<i>Semester III</i>			<i>Semester IV</i>
AS200	Animal Agriculture I*	AS230	Farm Animal Physiology*
B240	Genetics	B225	Microbiology
CS200	Biochemistry I	H205	Canadian Studies or
MP1**	Physics <i>or</i>	H101	The English and American Novel
	MP210 Introduction to Statistics	MP1**	Physics <i>or</i>
	Humanities/SS Elective		MP210 Introduction to Statistics
			Humanities/SS Elective

*May substitute another elective; check requirements of specific options to complete a degree at NSAC

**MP140 Physics I or MP150 Biophysics I

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.

Admission Requirements for Technician Programs Including Agricultural Business, Animal Science and Plant Science

High school graduation with three university preparatory courses in English, two in Mathematics, one in Biology and one in Chemistry is required.

Admission Requirements for Bio-Resources Engineering Technician

High school graduation with pass marks in and an average of at least 60% in English, Mathematics, Chemistry, Biology, and one other course, all at the following provincial levels: New Brunswick 120, 121 or 122; Newfoundland Academic 3; Nova Scotia 441 or 442; Prince Edward Island Academic XII.

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.

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:

- Ontario Agricultural College, University of Guelph, Guelph, Ontario
- Eastern College, Newfoundland
- Olds College, Olds, Alberta
- Lakeland College, Vermilion Campus, Vermilion, Alberta
- University of Maine
- Writtle College
- Arrangements may also be made for students who wish to complete a semester of study in Britain.

Students wishing to do a technical exchange program at another institution must have that program approved by the NSAC Technical Curriculum Working Group. The request should be submitted to the Working Group by the student's program advisor or the Department Head.

Upon approval of the program, the Chair of the Technical Curriculum Working Group will recommend to the Registrar which courses will be replaced in the student's program and which courses must be completed at the host institution. The programs must be laid out before the student leaves for the exchange institution.

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.

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.

SYLLABUS

Agricultural Business with a minor in Animal Science

Year I

Semester I

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

Semester II

CS13 Soil Management
 EB11 Applied Accounting and Taxation
 EB13 Microeconomics
 EB41 Business Law
 MP14 Computational Methods
 PS37 Field Crop Management

An additional course, AS12 Farm Workplace I, is optional for all students.

Year II

Semester III

AS16 Farm Animal Production I
 AS18 Farm Animal Biology I
 EB40 Marketing Practices
 EB65 Business Project
 EB340 Farm Management I
 AS12 Farm Workplace (Optional)

Semester IV

AS66 Farm Animal Production II
 AS68 Farm Animal Biology II
 EB42 Applied Farm Management
 EB220 Production Economics
 EB65 Project
Humanities Elective

Agricultural Business with a minor in Plant Science

Year I

Semester I

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

Semester II

CS13 Soil Management
 EB11 Applied Accounting and Taxation
 EB13 Microeconomics
 EB41 Business Law
 MP14 Computational Methods
 PS37 Field Crop Management

An additional course, AS12 Farm Workplace I, is optional for all students.

Year 2

Semester III

AS16 Farm Animal Production I
 B43 Entomology
 EB40 Marketing Practices
 EB65 Business Project
 EB340 Farm Management I
 PS200 Vegetable Production'
Humanities Elective

Semester IV

B40 Plant Pathology
 EB42 Applied Farm Management
 EB65 Business Project
 EB220 Production Economics
 PS49 Potato Production'
 PS76 Plant Products Physiology

¹May substitute PS43 or PS44 if timetable permits.

Agricultural Business with a minor in Agricultural Engineering

Year 1

Semester I

AE101 Computer Aided Graphics & Projection
 CS12 Principles of Soil Science
 CS14 Agricultural Chemistry
 EB10 Accounting
 EB12 Macroeconomics
 H10 Technical Writing

Semester II

CS13 Soil Management
 EB11 Applied Accounting and Taxation
 EB13 Microeconomics
 EB41 Business Law
 MP14 Computational Methods
Humanities Elective

An additional course, AS12 Farm Workplace I, is optional for all students.

Year 2

Semester III

AE202 Agricultural Machinery
 AS16 Farm Animal Production I
 EB40 Marketing Practices
 EB65 Business Project
 EB340 Farm Management I
 MP15 Introductory Physics
 PS36 Field Crops

Semester IV

AE38 Horticultural Engineering
 AE52 Agricultural Power Systems
 EB42 Applied Farm Management
 EB65 Business Project
 EB220 Production Economics
 PS37 Field Crop Management

ANIMAL SCIENCE

The Nova Scotia Agricultural College offers a two-year program in Animal Science to prepare students for careers on farms as animal husbandry specialists or as animal science technicians in agricultural services and industries. Students interested in working with lab or companion animal species should consider the Animal Health Technology program.

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.

There is a limited number of students accepted into the program. The selection process includes a written questionnaire, required of all students, and may include an interview either in person or by telephone.

Applications will be accepted until April 1. Students applying after that date will be considered only if space still exists.

Assuming published academic standards are met, acceptance is based primarily on an assessment of whether the student's goals are compatible with the objectives of the program. Priority will be given to students who have previous experience with farm animals and/or on commercial farms.

Individuals accepted to the program must be capable of working with all species of farm animals and in farm units on a regular basis. Students who are not able to meet these requirements may not be able to continue in the program. Protective clothing and footwear is required and appropriate vaccinations may be needed. Details will be sent to students on acceptance.

Animal Science

SYLLABUS¹

Year 1

Semester I

AS12	The Farm Workplace I
AS16	Farm Animal Production I
AS17	Farm Animal Production I Practices
AS18	Farm Animal Biology I
AS19	Farm Animal Biology I Practices
AS20	Farm Animal Breeding
CS12	Principles of Soil Science
H10	Technical Writing

Semester II

AS22	The Farm Workplace II
AS65	Project-Seminar
AS66	Farm Animal Production II
AS67	Farm Animal Production II Practices
AS68	Farm Animal Biology II
AS69	Farm Animal Biology II Practices
CS13	Soil Management
MP14	Computational Methods

Year 2

Semester III

AS76	Farm Animal Production III
AS77	Farm Animal Production III Practices
PS36	Field Crops
	<i>Economics Elective²</i>
	<i>Elective³</i>

Semester IV

AS86	Farm Animal Production IV
AS87	Farm Animal Production IV Practices
PS37	Field Crop Management
	<i>Economics Elective²</i>
	<i>Elective³</i>

Students should consult with the Program Coordinator prior to choosing electives.

¹Animal Science Technician students take required courses in the listed sequence, and in the listed semesters. Deviations from this will require written permission from the Head of the Animal Science Department.

²Students must choose two of the following four economics courses, EB10 and EB340 offered in the Fall semester or EB11 and EB41 offered in the Winter semester.

³Students may choose electives from other departments or from degree courses, if the timetable and prerequisites permit. Courses from other institutions and from NSAC Continuing Education programs may be recognized as electives. Students should consult with the program coordinator prior to choosing electives and apply to the Head of the Animal Science Department to have courses approved as electives.

BIO-RESOURCES ENGINEERING TECHNICIAN

Graduates of this two-year diploma program will have a basic understanding of environmental sciences, and will be aware of resource and waste management issues. They will be familiar with engineered physical systems such as buildings, equipment, and processes, and will have gained practical skills related to metal, plastics and wood construction.

Bio-Resources includes land use, soil, air, water, plants and plant products, animals and animal products, and fish and fish products. Prospective employers could be food or feed processing facilities, agriculture or aquaculture production operations, regulating agencies, environmental protection or remediation firms, recycling operations, or any businesses or industries producing, supplying, or utilizing products which relate to bio-resources.

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.

SYLLABUS

Year 1			
<i>Semester I</i>			<i>Semester II</i>
AE28	Wood Construction Techniques	AE16	Fluid Power
AS16	Farm Animal Production I	AE22	Engineering Principles
CS14	Agricultural Chemistry	AE29	Metal Construction Techniques
H10	Technical Writing	AE101	Computer Aided Graphics
MP15	Introductory Physics	MP70	Basic Statistics
PS30	Introduction to Plant Science	MP222	Computer Methods
Year 2			
<i>Semester III</i>			<i>Semester IV</i>
AE14	Surveying	AE33	Agricultural Structures
AE46	Soil & Water Resources Management	AE50	Electronics Instrumentation
AE200	Environmental Impacts & Resource Mgt.	AE52	Agricultural Power Systems
AS210	Introduction to Aquaculture	AE135	Fundamentals of Food Processing
CS220	Introduction to Soil Science	AE202	Agricultural Machinery
EB10	Accounting	H140	Personnel Management

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.

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.

Plant Science with specialization in Agronomy

SYLLABUS

Year 1

Semester I

AS16	Farm Animal Production I
B43	Entomology
CS12	Principles of Soil Science
EB10	Accounting
H10	Technical Writing
PS30	Introduction to Plant Science

Semester II

AS66	Farm Animal Production II
B41	Plant Physiology
B46	Weed Science
CS13	Soil Management
MP14	Computational Methods
PS49	Potato Production

Year 2

Semester III

AE202	Agricultural Machinery
AS12	Farm Workplace I
EB340	Farm Management I
MP15	Introductory Physics
PS36	Field Crops
	Plant Science <i>Elective</i>

Semester IV

AE52	Agricultural Power Systems
B40	Plant Pathology
EB41	Business Law
PS37	Field Crop Management
PS65	Plant Science Project ¹
	Humanities <i>Elective</i>

¹May substitute PS38 or PS44 if timetable permits.

Plant Science with specialization in Horticulture

Year 1

Semester I

B43	Entomology
CS12	Principles of Soil Science
EB10	Accounting
H10	Technical Writing
PS30	Introduction to Plant Science Plant Science <i>Elective</i>

Semester II

AE38	Horticultural Engineering
B41	Plant Physiology
B46	Weed Science
CS13	Soil Management
MP14	Computational Methods
PS49	Potato Production

Year 2

Semester III

MP15	Introductory Physics
PS39	Greenhouse Crop Management
PS36	Field Crops
PS43	Small Fruit Crops
PS47	Turfgrass Production and Management ¹
PS200	Vegetable Crops ¹

Semester IV

B40	Plant Pathology
PS38	Nursery Crop Production
PS37	Field Crop Management
PS44	Tree Fruit Crops
PS76	Plant Product Physiology Humanities <i>Elective</i>

¹May substitute PS65, PS147 or PS210 if timetable permits.

Plant Science with specialization in Ornamental Horticulture

Year 1

Semester I

B43	Entomology
CS12	Principles of Soil Science
EB10	Accounting
H10	Technical Writing
PS30	Introduction to Plant Science
PS55	Plant Propagation

Semester II

AE38	Horticultural Engineering
B41	Plant Physiology
B46	Weed Science
CS13	Soil Management
MP14	Computational Methods
PS38	Nursery Crop Production

Year 2

Semester III

PS39	Greenhouse Crop Management
PS43	Small Fruit Crops
PS47	Turfgrass Production and Management ¹
PS50	Landscape Horticulture I
PS200	Vegetable Crops ¹
PS60	Landscape Plant Materials I

Semester IV

B40	Plant Pathology
H140	Personnel Management
PS44	Tree Fruit Crops
PS61	Landscape Plant Materials II
PS72	Landscape Maintenance
PS76	Plant Products Physiology

¹May substitute PS65, PS147 or PS210 if timetable permits.

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 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. 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.

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.

ADMISSION 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. The selection process includes a full day of interviews and orientation. Applications will be accepted between January 2 and February 28.

SYLLABUS

Year 1

Semester I

AS10	Orientation to Animal Health
AS16	Farm Animal Production I
AS18	Farm Animal Biology I
B15	Animal Anatomy
CS14	Agricultural Chemistry
H10	Technical Writing

Semester II

AS11	Animal Handling
AS48	Animal Behaviour
AS66	Farm Animal Production II
AS68	Farm Animal Biology II
B225	Microbiology
MP14	Computational Methods

Year 2

Semester III

AS24	Principles of Disease
AS25	Animal Nursing and Clinical Procedures I
AS37	Laboratory Animal Care I
AS39	Veterinary Lab Techniques I
AS40	Support Services in Veterinary Practice

Semester IV

AS36	Principles of Pharmacology
AS46	Animal Nursing and Clinical Procedures II
AS49	Veterinary Lab. Techniques II
AS320	Animal Health
H45	Technical Communications

Year 3

Semester V (Summer-Fall)

AS99	Practicum - Animal Health Technology
------	--------------------------------------

Semester VI

AS59	Veterinary Lab. Technniques III
AS71	Laboratory Animal Care II
AS75	Animal Nursing and Clinical Procedures III
AS95	Animal Health Technology Project

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 with data acquisition of forestry or silviculture-related programs
- technologists trained to work in the life sciences and related fields

ADMISSION 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 Laboratory Techniques
H10	Technical Writing
MP15	Introductory Physics

Semester II

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

Year 2

Semester III

AS18	Farm Animal Biology I
B200	Cell Biology
B265	Systematic Botany
CS12	Principles of Soil Science
CS30	Chemical Calculations

Semester IV

B40	Plant Pathology
B41	Plant Physiology
B355	Food Microbiology
MP70	Basic Statistics
MP222	Computer Methods

Year 3

Semester V

AS37	Laboratory Animal Care I
B43	Entomology
B44	Techniques for Biology Technologists I
B330	Ecology
	<i>Elective</i>

Semester VI

B46	Weed Science
B48	Plant Tissue Culture
B61	Techniques for Biol. Technologists II
B75	Biological Photography
	<i>Elective</i>

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.

ADMISSION 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	Introductory Laboratory Techniques
CS100	Chemical Principles (Lectures only)
H10	Technical Writing
MP100	Calculus and Analytic Geometry I

Semester II

B225	Microbiology
CS43	Bio-Organic Chemistry
CS225	Quantitative Analytical Chemistry
MP70	Basic Statistics
MP222	Computer Methods or <i>Elective</i> <i>Elective</i>

Year 2

Semester III

CS50	Introduction to Physical Chemistry
CS75	Basic Food Chemistry
CS79	Project Organization
CS220	Introduction to Soil Science
CS305	Instrumental Analytical Chemistry
MP222	Computer Methods or <i>Elective</i>

Semester IV

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

FOOD QUALITY

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

ADMISSION 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 or
Elective

Year 2

Semester III

AS345 Eggs and Dairy Products
 CS30 Chemical Calculations
 CS75 Basic Food Chemistry
 CS305 Instrumental Analytical Chemistry
 MP222 Computer Methods *or*
Elective

Semester IV

AE135 Fundamentals of Food Processing
 B355 Food Microbiology
 CS225 Quantitative Analytical Chemistry
 CS350 Food Chemistry
 CS370 Instrumental Food Analysis

Year 3

Semester V

CS95 Practicum - Food Quality Technology

Semester VI

AS350 Meat Science
 B41 Plant Physiology
 CS73 Laboratory Organization and
 Management
 CS380 Food Quality Assurance
 PS76 Plant Products Physiology

LANDSCAPE HORTICULTURE

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.

ADMISSION 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. Applicants may be required to attend a selection interview.

SYLLABUS

Year 1

Semester I

AE101	Computer Aided Graphics & Design
CS12	Principles of Soil Science
PS47	Turfgrass Production and Management
PS50	Landscape Horticulture I
PS55	Plant Propagation
PS60	Landscape Plant Materials I

Semester II

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

Spring Session

PS70	Landscape Techniques - 12 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.

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.

AGRICULTURAL TECHNOLOGY

A person with an NSAC Technician Diploma or with equivalent standing may apply to continue studies which would lead to a Diploma of Technology in Agricultural Technology. A Diploma of 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.

The program of study including a Technology Project course (AE90, AS90, EB90, or PS90) 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.

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 Bio-resources 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.

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

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.

SYLLABUS

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

Year 1

Semester I

- AS12 Farm Workplace I
- CS14 Agricultural Chemistry
- EB10 Accounting
- EB40 Marketing Practices
- EB340 Farm Management I
- MP15 Introductory Physics
- PS36 Field Crops

Semester II

- AE52 Agricultural Power Systems
- CS13 Soil Management
- EB11 Applied Accounting and Taxation
- EB220 Production Economics
- MP14 Computational Methods
- PS37 Field Crop Production

Semester III

EB95 Practicum - Farming Technology, a seven-month contract, is developed between the College, the student, and a training farmer, following the first year of the program.

Year 2

Semester IV

- EB42 Applied Farm Management
- EB72 Farm Project
- 13 Electives

Recommended Electives:

Semester I

- AE14 Surveying
- AE28 Wood Construction Techniques
- AE101 Computer Aided Graphics
- AE202 Agricultural Machinery
- AS16 Farm Animal Production I
- AS18 Farm Animal Biology I
- AS76 Farm Animal Production III
- B43 Entomology
- EB12 Macroeconomics
- PS39 Greenhouse Crop Management
- PS43 Small Fruit Crops
- PS55 Plant Propagation
- PS147 Farm Woodlot Management
- PS200 Vegetable Crops
- PS49 Potato Production
- PS76 Plant Production Physiology
- PS210 Principles of Organic Horticultural
Crop Production
- Humanities Course

Semester II or IV

- AE29 Metal Construction Techniques
- AE38 Horticultural Engineering
- AE39 Tractor Overhaul
- AS66 Farm Animal Production II
- AS68 Farm Animal Biology II
- AS87 Farm Animal Production IV
- 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

BACHELOR OF TECHNOLOGY (LANDSCAPE HORTICULTURE)

The Nova Scotia Agricultural College offers this program which is designed to prepare students for a career in the landscape horticulture profession. It will prepare students to work successfully in the diverse landscape industry or to create their own businesses within the industry. This major could also lead to graduate study in the area of landscape architecture and related fields.

Years one and two of this program are satisfied by the successful completion of the Landscape Horticulture Technology program or its equivalent with a cumulative average of at least 70 percent. Applicants who meet the general requirements described above (two years postsecondary) may be admitted to the program upon completion of prescribed preparation courses.

Year 3

Spring Semester

PS270 Landscape Horticulture Work Program I
(12 weeks)

Semester V

CS100 Chemical Principles
B100 Botany
CS345 Soil Conservation

Semester VI

AE365 Principles of Engineering in
Landscape Horticulture

Year 4

Semester VII

B330 Ecology
PS360 Landscape Horticulture Project I

Semester VIII

PS390 Insects and Diseases of Landscape
Plants

Other Required Courses:

CS457 The Science of Composting and its Application*
Humanities *Elective* at the 200 level or above

Students must take 11 (eleven) additional degree course electives. Four of the selected electives must be *Landscape Electives*.

Landscape Electives: Students must choose 4 (four) electives from the following list.

AE370 Irrigation and Drainage
PS290 The British Garden
PS370 Landscape Horticulture Work Program II
PS380 Landscape Construction and Estimating
PS440 Management of Specialized Turf
PS460 Landscape Horticulture Project II
PS470 Tree Management

* Offered in Alternate Years. Please see calendar description for next scheduled session.

DESCRIPTION OF COURSES - UNDERGRADUATE AND TECHNICAL

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

Students requiring courses for their program are given priority over students who are using this course as an elective. Enrollment in some cases may be restricted to specific program groups or may have maximum enrollment.

Course information indicates the weekly instructional requirement in hours per week. Thus "Winter: 3 lecs, 1 tut, 3 labs" would indicate that the student would attend 3 hours of lecture, 1 hour of tutorial, and 3 hours of lab in the winter semester. It does NOT indicate how many separate instructional sessions there are. For example, the 3 lecture hours may be 3 one-hour sessions, or two one and a half-hour sessions.

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

AGRICULTURAL ENGINEERING

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 3 labs per week.

AE16: Fluid Power Control

Instructor: **Prof. Rifai**

Introduction to concepts of control of pressure and flow of fluids used in industry. Concepts of pressure and flow with respect to pumps, compressors, actuators, flow and pressure control valves are discussed. Emphasis is placed on understanding complete systems and an ability to accurately trouble-shoot a system failure. Proper selection, maintenance, and repair procedures and consideration of material compatibilities and fluid conditioning are included.

Winter Semester- 2 lecs and 2 labs per week.

AE22: Engineering Principles

Instructor: **Prof. Cunningham**

Mathematical concepts will be applied with engineering principles to solve problems encountered in various work environments. Topics will include units of measure, systems of units, distance, area, volume, force, pressure, work, power, energy, fluid flow rates, etc. Applications will involve hydraulics, equipment calibration, power transmission, speed ratios, concentrations of solutions, triangulation and land area calculations, earth cut and fill volumes.

Winter semester - 3 lecs and 1 lab per week.

AE28: Wood Construction Techniques

Instructor: **Mr. Bholia**

An introductory course in the selection, operation, and maintenance of woodworking hand and power tools. The principles of selection, operation, and maintenance of workshop tools in the modern woodworking shop are studied. Students will be required to present seminars on various fabrication techniques and construction tools. Occupational safety will be emphasized in safeguarding of machines, use of abrasive power tools, portable power tools, and in equipment isolation and lock-out. Students are required to develop plans and produce a project.

Fall Semester - 2 lecs and 3 labs per week.

AE29: Metal Construction Techniques

Instructor: **Mr. Hampton**

An introductory course in the selection, operation, and maintenance of metalworking hand and power tools. The principles of oxyacetylene welding, cutting, and brazing of mild steel will be examined. Electric arc and MIG welding techniques are present. Students will be required to present seminars on various fabrication techniques and construction tools. Occupational safety will be emphasized in safeguarding of machines, use of abrasive power tools, welding, cutting, burning, soldering, and in equipment isolation and lock-out. Students are required to develop plans and produce a project.

Winter Semester - 2 lecs and 3 labs per week.

AE33: Agricultural Structures

Instructor: **TBA**

This course includes a study of the space

requirements, environmental requirements, materials and methods of construction of structures utilized in agricultural production and processing systems. Environmental principles and products, livestock and operators. Properties of common construction materials are investigated with emphasis on their efficient utilization. Students gain familiarity with construction drawings, material lists and building codes.

Winter semester - 2 lecs and 3 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 3 labs per week.

AE39: Tractor Overhaul

Instructors: **Mr. Terry**

Prerequisite: AE16

Preparatories: AE29, AE52

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.

AE46: Soil and Water Resources Management

Instructor: **Prof. Madani**

This course examines the fundamentals of soil and water management with application to agriculture. The course deals with hydrology, erosion, irrigation and drainage systems, water quality related to agriculture and water table management.

Fall semester - 2 lecs and 3 labs per week.

AE50: Electronic Instrumentation

Instructor: **Prof. Adsett**

Basic electrical and electronic theory are examined and applied to instruments and measurement systems. Low voltage control circuits are included, and electronic components and software are introduced as they apply to measurement systems. Laboratory assignments deal with electrical and electronic circuitry, and the collection of data using several types of measurement systems.

Winter semester - 3 lecs and 3 labs per week.

AE52: Agricultural Power Systems

Instructor: **Prof. Rifai**

Tractor engines are studied as well as the theory of power transmission in farm tractors and other agricultural vehicles. Principles of electric motors, and their power transmission applications will also be studied. Maintenance and trouble-shooting are also included. Other farm power options will be considered, such as solar, wind and water power.

Winter semester - 3 lecs and 3 labs per week.

AE101: Computer Aided Graphics and Projection

Instructor: **Mr. Canning**

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.

Both semesters - 2 lecs and 3 labs per week.

AE102: Design and Graphics

Instructor: **Prof. Cunningham**

This course will provide students with experience in conceptual design, team work and utilizing CAD. Students will develop skills such as engineering free-hand sketching, 3-D visualization and reading/production of engineering drawings. Communications via the "graphics language" will culminate through the presentation of design projects and solutions.

Winter semester - 2 lecs and 3 labs per week.

AE110: Statics

Instructor: **Prof. Rifai**

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.

Fall semester - 3 lecs and 3 labs per week.

Text - Hibbeler, *Engineering Mechanics*.

AE120: Properties and Mechanics of Materials

Instructor: Prof. Havard

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.

Winter semester - 3 lecs and 3 labs per week

AE135: Fundamentals of Food Processing (A)

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 3 labs per week.

AE200: Environmental Impacts & Resource Management (A)

Instructor: Prof. Blanchard

Prerequisites: 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 bio-resource 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.

AE202: Agricultural Machinery

Instructors: Prof. Sibley

Engineering principles of farm machinery are studied, including machinery for soil preparation, planting, crop care, and harvesting. Machines and their unit operations are analyzed with respect to function, work rates, material flows, and power usage. The importance of monitoring machine performance relating to work quality and environmental effects of machine operation will be studied. Laboratories will emphasize safety, basic maintenance, adjustment, calibration, and performance testing.

Winter semester - 3 lecs and 3 labs per week.

AE206: Design Project

Instructor: TBA

Prerequisites: AE102, AE315

This self-study course provides a project-based exercise in the engineering design process. Students work in teams and as individuals on defined projects which utilize knowledge and skills in graphics, statics, computing, and mechanics of materials. The projects encompass conceptual design, detailed analysis, engineering drawings, experimentation, physical model fabrication, laboratory testing, and preparation of professional reports.

Fall semester - 4 labs per week.

AE215: Aquatic Environment (A)

Instructor: Prof. Blanchard

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.

AE230: Dynamics

Instructor: Prof. Rifai

Prerequisites: MP105, MP140 or MP150

The dynamics course represents the second class in the study of engineering mechanics. Topics include kinematics, kinetics, work and energy, linear and angular impulse momenta of a single particle and of rigid bodies in planar motion. There will be some computer applications wherever appropriate.

Winter semester - 3 lecs and 3 labs per week.

AE260: Surveying

Instructor: Prof. Havard

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.

AE300: Electric Circuits

Instructor: Prof. Havard

Prerequisite: MP145

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.

AE305: Engineering Measurements and Controls (A)

Instructor: **Prof. Havard**

Prerequisite: MP140 or MP150

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

Winter semester - 3 lecs and 3 labs per week.

AE310: Thermodynamics

Instructor: **Prof. Havard**

Prerequisite: MP140 or MP150

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

Instructor: **Prof. Sibley**

Prerequisites: AE110, MP105, MP140 or MP150

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.

Fall semester - 3 lecs and 2 labs per week.

Text - Hibbeler, *Mechanics of Materials*.

AE320: Structures & Their Environment (A)

Instructor: **TBA**

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 & Processing (A)

Instructor: **Prof. Adsett**

Prerequisite: MP105

Preparatory: MP140 or MP150

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 (A)

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 3 labs per week.

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

AE350: Fluid Mechanics

Instructor: **Prof. Madani**

Prerequisite: AE230 or Instructor's permission

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 (A)

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 (A)

Instructor: **Prof. Blanchard**

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.

Winter semester - 3 lecs and 3 labs per week.

AE365: Principles of Engineering in Landscape Horticulture

Instructor: **Prof. Cunningham**

Mathematical concepts will be applied with engineering principles to solve problems encountered in landscape horticulture. Topics will include units of measure, systems of units, distance, area, volume, force, pressure, work, power, energy, rates of flow/application, calibration, concentrations of solution. Applications will include hydraulics, fluid flow and equipment calibration, power transmission and speed ratios, earth cut and fill volumes, triangulation and area calculations.

Winter semester - 3 lecs per week.

AE370: Irrigation and Drainage

Coordinators: **Profs. Havard and Madani**

This course examines basic soil-water-plant-atmosphere relationships. It introduces students to soil and water conservation and management principles. The course covers irrigation and drainage of golf courses, athletic areas, parks and residential landscape.

Fall semester - 2 lecs and 3 labs per week.

Offered in alternate years, next offered 1998-99.

AE380: Engineering Economy

Instructor: **Prof. Adsett**

This course deals with the economics of decision making. After introducing fundamental concepts and cash flow diagrams, interest factors are dealt with in some detail. A variety of discounted cash flow techniques are covered including rate of return calculations. Inflation, accounting, tax and risk are also amongst the topics considered.

Winter semester - 2 lecs and 3 labs per week.

AE405: Environmental Impacts & Resource Management (A)

Instructor: **Prof. Blanchard**

Prerequisites: 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 bio-resource 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.

Last offered 1998-99.

AE410: Water & Water Quality Management (A)

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 (A)

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 (A)

Instructor: **Prof. Adsett**

Prerequisite: MP105 or MP140 or MP150

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 practical management decisions in production or processing operations of the student's interest.

Winter semester - 2 lecs and 3 labs per week.

AE449: Project-Seminar I (A)

Coordinator: **Prof. Cunningham**

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

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

Winter semester - 1 scheduled seminar session per week.

AE450: Project-Seminar II (A)

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 practised in assigned periods of duty in the College's facilities. The topics of credentials and legislation are introduced, especially as these relate to the AHT. The routines followed in animal hospitals, research institutions, and other places where AHTs are employed are examined with special reference to the duties and responsibilities of the technical assistant. Routes of drug administration are defined and demonstrated, and specific dose rate calculations are performed. In practical sessions the student learns to operate and maintain specified items of clinical equipment.

Fall semester - 4 lecs and 1 lab per week.

AS11: Animal Handling

Instructor: **Prof. Ramsay**

Prerequisites: 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.

AS12: The Farm Workplace I

Instructors: **Plant Science Staff**

Coordinator: **Prof. Scott**

Diverse aspects of the farm workplace will be covered, with the major emphasis on occupational health and safety, proper attention to protocols and standard operating procedures, relevant legal aspects, and workplace issues and relationships. Specific skills instruction will cover equipment calibration, the use of selected tools, safe equipment and machinery operation, and the fundamentals of farm operations. Trouble-shooting and decision making as relevant to safety and maintenance will also be emphasized. The skills may be learned on the campus, on approved farms, or at other institutions pending approval by the Animal Science Department.

Fall semester - 1 lec and 3 labs per week

AS16: Farm Animal Production I

Instructors: **Animal Science Faculty**

Coordinator: **Prof. Scott**

A study of farm animals with the major emphasis on anatomy, growth, lactation, egg production, fur production and livestock housing as related to the life cycle of farm animals and the principles of farm animal production. The course will enable students to discuss livestock production and apply biological principles relevant to livestock production. Lab topics will emphasize livestock handling, safety around livestock, stockmanship and management skills, livestock measurements and evaluation, data collection, livestock records, and environmental aspects. Diverse aspects of farm animal production will be covered, but the focus will be on providing a general background, rather than on specific disciplines or on specific types of livestock production.

Fall semester - 3 lecs and 2 labs per week.

AS17: Farm Animal Production I Practices

Instructor: **Animal Science Staff**

Coordinator: **Prof. Scott**

Corequisites: AS16, AS19

This course will require Animal Science Technician students to expand on the concepts covered in Farm Animal Production I, to relate these concepts to the producing animal, and to develop competency in the husbandry skills necessary for working on livestock farms. The course will emphasize detailed lab instruction in daily farm routines, management skills, livestock measurements and evaluation, observations and environmental monitoring. Diverse aspects of Animal Production will be covered, but the focus will be on providing an all-round background rather than on specific types of livestock production.

Fall semester - 6 labs per week.

AS18: Farm Animal Biology I

Instructors: **Animal Science Faculty**

Coordinator: **Prof. Scott**

A study of Farm Animal Biology with the major emphasis on the fundamental principles of anatomy, physiology, genetics, and nutrition. The course will enable students to describe the biological life cycles of farm animals and to relate the principles of biology to farm animal production. Diverse aspects of Animal Biology will be covered, but the focus will be on providing a general background, rather than on specific disciplines or on specific types of livestock production.

Fall Semester - 3 lecs and 2 labs per week.

AS19: Farm Animal Biology I Practices

Instructors: **Animal Science Staff**

Coordinator: **Prof. Scott**

Coorequisites: AS17, AS18

The course will require Animal Science Technician students to expand on the biological concepts covered in Farm Animal Biology I, to relate these concepts to the producing animal, and develop competency in the skills necessary for the application of biological principles to livestock management practises. The course will emphasize detailed lab instruction in anatomy and structure, biological features of the productive animal, livestock and livestock products measurements and evaluation, observations and environmental monitoring. Diverse aspects of Animal Biology will be covered, but the focus will be on providing a general background in biology, rather than on specific disciplines or on specific types of livestock production.

Fall semester - 6 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 Math, Physics and Humanities Department.

Fall semester - 3 lecs and 2 labs per week.

AS22 : The Farm Workplace II

Instructors: **Animal Science Staff**

Coordinator: **Prof. Scott**

Prerequisite: AS12

Diverse aspects of the livestock farm as a workplace will be covered with the major emphasis on occupational health and safety, workplace ethics, proper attention to protocols and SOP's, relevant legal aspects and workplace issues. Specific skills instruction will cover fundamental tool, equipment and machinery operation and maintenance in the following areas: safety around electrical systems, livestock water supply, manure handling and storage, weather maintenance, feeding equipment maintenance, and building sanitation. Students will be expected to achieve competence in these skills, as well as in trouble-shooting and decision making as relevant to safety and maintenance. The skills may be learned on campus, on approved farms, or at other institutions pending approval by the Animal Science Department.

Winter semester - 1 lec and 3 labs per week.

AS24: Principles of DiseaseInstructor: **Prof. Prowse***Prerequisites:* AS10, B15, 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 IInstructor: **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.

AS36: Principles of PharmacologyInstructor: **TBA***Prerequisite:* AS25

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 IInstructor: **Prof. Ramsay**

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 ICoordinator: **Prof. Ramsay***Prerequisite:* B225, CS42 or CS14*Corequisite:* AS24

In classroom and lab practical sessions this course covers a variety of techniques commonly required of the AHT in the veterinary hospital laboratory. Operation and maintenance of the microscope is reviewed; the skills required in the clinical laboratory pertinent to microbiology, parasitology, urinalysis, and certain aspects of blood analysis are 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 PracticeInstructor: **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.

Fall semester - 4 lecs per week.

AS46: Animal Nursing and Clinical Procedures IIInstructor: **Animal Science Staff***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.

AS48: Animal BehaviourInstructor: **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 IICoordinator: **Prof. Ramsay***Prerequisites:* 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 practised and evaluated in the lab component of this course. Terminal performance in laboratory techniques should demonstrate observance of principles and good manual skills.

Winter semester - 4 lecs and 5 labs per week.

AS59: Veterinary Laboratory Techniques IIICoordinator: **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 4 labs per week.

AS65: Project-SeminarCoordinator: **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.

AS66: Farm Animal Production IIInstructors: **Animal Science Faculty**Coordinator: **Prof. Scott***Prerequisite:* AS16

A study of farm animals with the major emphasis on livestock feeds and feeding technology, farm animal

reproduction, farm animal breeds and breeding systems, and animal health as related to the life cycle of farm animals and the principles of farm animal production. The course will enable students to discuss livestock production and to apply biological principles relevant to livestock production. Diverse aspects of farm animal production will be covered, but the focus will be on providing a general background, rather than on specific disciplines or on specific types of livestock production.

Winter semester - 3 lecs and 2 labs per week.

AS67: Farm Animal Production II PracticesInstructors: **Animal Science Staff**Coordinator: **Prof. Scott***Prerequisites:* AS17, AS19*Corequisites:* AS66, AS69

This course will require Animal Science Technician students to expand on the concepts covered in Farm Animal Production II, and to further develop their livestock management skills. Coverage of topics will emphasize competence in stockmanship and management skills, livestock measurements and evaluation, data collection and recording, observation, and facilities maintenance. Diverse aspects of Animal Production will be covered, but the focus will be on providing a general background in Animal Production, rather than on specific disciplines or on specific types of livestock production.

Winter semester - 6 labs per week.

AS68: Farm Animal Biology IIInstructors: **Animal Science Faculty**Coordinator: **Prof. Scott***Prerequisite:* AS18

A study of Farm Animal Biology with the major emphasis on the fundamental principles of animal nutrition and digestive physiology, farm animal genetics, reproductive physiology and animal health. The course will enable students to describe the biological life cycles of farm animals and to apply biological principles to farm animal production. Diverse aspects of animal biology will be covered, but the focus will be on providing a general background, rather than on specific disciplines or on specific types of livestock production.

Winter semester - 3 lecs and 2 labs per week.

AS69: Farm Animal Biology II PracticesInstructors: **Animal Science Staff**Coordinator: **Prof. Scott***Prerequisites:* AS17, AS19*Corequisites:* AS67, AS68

This course will require Animal Science Technician students to expand on the biological concepts covered in Farm Animal Biology II, to relate these concepts to the producing animal, and to develop competency in the skills necessary for an application of biological principles to livestock management practises. Lab topics will emphasize detailed instruction in anatomy and structure, biological features of the productive animal, livestock measurements and evaluation, observations and environmental monitoring. Diverse aspects of animal biology will be covered, but the focus will be on providing a general background in biology, rather than on specific disciplines or on specific types of livestock production.

Winter semester - 6 labs per week.

AS71: Laboratory Animal Care II

Coordinator: **Prof. Ramsay**

Prerequisites: AS37, AS15, AS46

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

Winter semester - 3 lecs and 3 labs per week.

AS75: Animal Nursing and Clinical Procedures III

Instructor: **Prof. Ramsay**

Prerequisites: AS80, AS81, 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.

AS76: Farm Animal Production III

Instructors: **Animal Science Faculty**

Coordinator: **Prof. Scott**

Prerequisites: AS16, AS18, AS66, AS68

A detailed study of selected areas in farm animal production, with the major emphasis on the principles and theory underlying current management practices. Students will be expected to achieve competence in selected managerial, learning, and problem solving skills, and to develop an understanding of the application of biological and management principles to livestock production practises. Management of specific classes of livestock management will be studied in the context of reproduction and breeding, animal genetics, feeding and applied animal nutrition, housing and environmental physiology, animal health, livestock products, processing and sales, and production costs. The relationships among these subject areas and the integration of the farm as a whole will also be covered, with emphasis on how the enterprise fits into the Atlantic Canadian agricultural industry.

Fall semester - 6 lecs and 2 tutorials per week.

AS77: Farm Animal Production III Practices

Instructors: **Animal Science Staff**

Coordinator: **Prof. Scott**

Prerequisites: AS12, AS17, AS19, AS22 AS67, AS69

Corequisites: AS76

A detailed study of selected areas in farm animal production, with the major emphasis on production and farm operation skills. Students will be expected to achieve competence in the skills, farm operations and routines associated with reproduction and breeding, animal genetics, feeding and applied animal nutrition, housing and environmental physiology, animal health and livestock marketing. The course will cover individual subject areas as they coincide chronologically with the normal management activities on the College farm. The subject areas will also represent the divisions important in commercial production systems.

Fall semester - 16 labs per week.

AS86: Farm Animal Production IV

Instructors: **Animal Science Faculty**

Coordinator: **Prof. Scott**

Prerequisites: AS16, AS18, AS66, AS68

A detailed study of selected areas in farm animal production, with the major emphasis on the principles and theory underlying current management practises. Students will be expected to achieve competence in selected managerial, learning and problem solving skills, and to apply biological and management principles to livestock production practises. Management of specific classes of livestock will be studied in the context of

reproduction and breeding, animal genetics, feeding and applied animal nutrition, housing and environmental physiology, animal health, livestock products, processing and sales, and production costs. The relationships among these subject areas and the integration of the farm as a whole will also be covered, with emphasis on how the enterprise fits into the Atlantic Canadian agricultural industry.

Winter semester - 6 lecs and 2 tutorials per week.

AS87: Farm Animal Production IV Practices

Instructors: **Animal Science Staff**

Coordinator: **Prof. Scott**

Prerequisites: AS12,AS17,AS19,AS22, AS67, AS69

Corequisite: AS86

A detailed study of selected areas in farm animal production, with the major emphasis on production and farm operation skills. Students will be expected to achieve competence in the skills, farm operations and routines associated with reproduction and breeding, animal genetics, feeding and applied animal nutrition, housing and environmental physiology, animal health and livestock marketing. The course will cover individual subject areas as they coincide chronologically with the normal management activities on the College farm. The subject areas will also represent the divisions important in commercial production systems.

Winter semester - 16 labs per week.

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 3 labs per week.

AS99: Practicum - Animal Health Technology

Coordinator: **Prof. Ramsay**

Prerequisites: Completion of all courses in the first four semesters of the AHT Program or permission of the Faculty of the Department of Animal Science. Completion of the credit for AS99 is required for admission to the final semester courses of the AHT program. No percentage mark is given for this course but credit is awarded upon satisfactory completion of all components.

The AHT Practicum involves off-campus learning experiences in workplace settings. Part 1 is an externship conducted by the Atlantic Veterinary College (AVC) at the University of Prince Edward Island.

Part 2 involves one or more other externships. The student must complete a veterinary practice externship at an approved location. The student may also complete another externship in a non-practice (institutional) setting.

Part 1. The AVC portion of the practicum is six or seven weeks long and is operated in the early part of the summer. Students attend this externship in one or two sections. Room and board during the externship and transportation to the Atlantic Veterinary College are the responsibility of the student.

During this period, students are given training in clinical areas of the AVC Veterinary Teaching Hospital (VTH). A rotation through various areas of the VTH typically includes assignments in: Small and Large Animal Medicine, Surgery and Anesthesiology; Theriogenology and the Ambulatory Clinic.

Students work with and learn from AHTs and other para-professional staff. A certificate is awarded for successful completion of this component of the AHT Practicum.

Part 2. The veterinary practice portion of the

Practicum involves an externship of at least ten weeks in an approved private veterinary practice. Students locate these from a list of available practices supplied by NSAC. A new practice located by the student may be approved.

Student-trainees normally earn a salary on this portion of the practicum as they gain experience in a variety of clinical and other relevant skills.

Students who wish to complete externships at other locations in addition to that in veterinary practice, may do so as part of this Practicum course.

AS200: Animal Agriculture I (A)

Instructors: **Department of Animal Science Faculty**

Prerequisites: IN100, IN101

An introductory course dealing with the major animal industries and production systems in animal agriculture today, with emphasis on systems relevant to Atlantic Canada. A key objective of this course is to let students see how real farms and real agribusinesses work. Emphasis will be placed on management and production of beef cattle, sheep and dairy. Additional animal industries that are particularly seasonal in nature, eg., fur growth and pelting, may be introduced as is appropriate.

Fall semester - 3 lecs and 3 labs per week.

AS201: Animal Agriculture II (A)

Instructors: **Department of Animal Science Faculty**

Prerequisites: IN100 IN101

Recommended: AS200

A continuation of Animal Agriculture I, emphasizing the management and production of poultry, swine, fur and alternative species.

Winter semester - 3 lecs and 3 labs per week.

AS210: Introduction to Aquaculture (A)

Instructors: **Various Faculty**

Coordinator: **Prof. Anderson**

Prerequisites: IN100, IN101

The history and current status of world aquaculture production are discussed, with emphasis on species with potential in Atlantic Canada. Advances in fresh water or marine finfish and shellfish culture are included. Aquatic plant production is discussed. Business aspects of aquaculture are introduced. The course includes field trips to aquaculture and related facilities.

Fall semester - 3 lecs and 3 labs per week.

AS230: Physiological Systems of Farm Animals

Instructor: **Prof. Lirette**

Prerequisites: B110, CS200

Suggested corequisite: B200

An introduction to the body systems and how they function. The student should develop a basic understanding of physiological processes and how they are regulated and integrated by the nervous and endocrine systems. Topics covered include cardiovascular, renal, gastrointestinal, reproductive, metabolic and respiratory physiology.

Winter semester - 3 lecs and 3 labs per week.

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.

AS305: Animal Nutrition

Instructors: **Profs. Firth 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, MP210, MP222

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.

AS320: Animal Health (A)

Instructor: **Dr. Semple**

Prerequisite: B225

Preparatory: CS205

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

Winter semester - 2 lecs and 2 labs per week.

AS325: Applied Animal Nutrition (A)

Instructors: **Profs. Firth 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*.

AS330: Growth, Reproduction and Lactation (A)

Instructor: **Prof. MacLaren**

Prerequisite: AS230

A continuation of AS230, emphasizing physiological systems relevant to animal production. Major topics include growth and development as it applies to meat and brood animal production, and the physiology and management of reproduction and lactation in domestic species.

Fall semester - 3 lecs and 2 labs per week.

AS335: Environmental Physiology (A)

Instructor: **Prof. Tennessen**

Prerequisite: AS230

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: AS230

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 and 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 and 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 by-products.

Winter semester - 2 lecs and 2 labs per week.

AS365: Fish Nutrition (A)

Instructor: **Prof. Anderson**

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.

AS370: Fish Health (A)

Instructor: **Prof. Duston**

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.

AS375: Aquatic Ecology

Instructor: Prof. Enright

Prerequisite: AE215

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.

Fall semester - 3 lecs and 3 labs per week.

AS380: Physiology of Aquatic Animals (A)

Instructor: Prof. Duston

Prerequisite: 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.

AS440: Finfish Production

Instructor: Prof. Duston

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.

AS445: Shellfish Production

Instructor: Prof. Enright

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.

AS449: Project-Seminar I (A)

Instructors: Department of Animal Science Faculty

Coordinator: Prof. Patterson

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: Department of Animal Science Faculty

Coordinator: Prof. Patterson

Prerequisite: AS449

Winter semester - 2 labs per week.

AS460: Avian Biology

Instructor: TBA

Prerequisites: AS201, CS200, B200, B240

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

Fall semester - 3 lecs and 2 labs per week.

AS465: Molecular Applications to Animal Production (Pending program implementation)

Instructors: Profs. MacLaren and Farid

Prerequisites: CS200, B240

Corequisite: B420

This upper-level course is designed for students interested in the molecular and cellular techniques that are being applied to animal production systems and research. Topics include molecular techniques used in research, DNA fingerprinting, marker-assisted selection, embryo IVF/sexing/ nuclear transfer, recombinant protein production, the use of recombinant microbes in ruminants, stem cell and transgenic animal production.

Fall semester - 3 lecs and one three-period lab or tutorial per week.

AS470: Animal Cell Culture (Pending program implementation)

Coordinator: Prof. MacLaren

Prerequisite: B201, IN395

The objective of this course is to provide a theoretical and practical understanding of the uses and methods of animal cell culture. Lectures and laboratories will demonstrate the requirements of animal cells for normal growth and differentiation, the use of cell cultures as research models and for clinical, pharmaceutical and cytotoxicity screening will be discussed, as well as the commercial use of animal cell culture for the production of biological compounds.

Winter semester - 2 lecs and 4 labs per week.

AS475: Ruminant Digestive Physiology & Metabolism

Instructors: **Profs. Fredeen and Lirette**

Prerequisites: AS230, 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.

Next offered in 1998-99.

AS480: Animal Product Design and Marketing (A)

Coordinator: **Prof. Firth**

Prerequisites: AS305, AS310, AS330

This course is offered with the co-operation of the Marketing Branch of the Nova Scotia Department of Agriculture and Marketing. It looks at the connection between the technology of animal products (meat, fish, milk, eggs) and meeting the desires of the market.

Fall semester - 3 lecs and 2 labs per week.

First offered 1999-2000.

AS485: Sustainable Animal Systems Design (A)

Instructor: **Prof. Fredeen**

Prerequisites: AS200, AS201, AS305, AS310, AS330

In this course, students will study animal production from a systems perspective, examining the current and future niches of animals in the agrifood industry. Emphasis will be placed on the design of a sustainable production system, including economic, environmental and social aspects of sustainability. Nutrient and energy flows in the designed systems will be modelled, and partial economic analyses will be conducted. The resiliency of the system will be determined by examining the effects of internal (e.g. change in family structure or system productivity) and external change (e.g. policy or climatic change), and the strengths and weaknesses of the systems, will be examined. Students will design a sustainable system of their choice, with the objective of producing a marketable animal product. Model output will be verified using data collected on farms.

Winter semester - 3 lecs and 3 labs per week.

AS490, AS492, AS494: Topics in Animal

Production I (A)

Instructors: **Department of Animal Science Faculty**

Prerequisites: AS305, AS310, AS330

This is a series of applied production courses which may be taken as early as semester six of the 3rd year in the Animal Science Major. These courses are offered both semesters and the content may vary from year to year. The course may be taken up to three times by a student. The course number reflects whether it is the first, second or third time a student is enrolled. For example, the first time a student takes this production course, it will be AS490; the second time, AS492; and the third time, AS494.

Each course consists of three consecutive four-week modules on applied topics in animal production. These modules will focus on the application of the sciences of genetics, physiology, nutrition and/or behaviour to animal production in the Atlantic Provinces. Students may combine modules to concentrate on a particular species or animal science discipline that they are interested in. At least two modules will be offered during each four-week period. Occasionally modules may be scheduled outside regular class time, but this will be indicated prior to sign-up. Students are to see their Animal Science Advisor for selection and availability of modules prior to enrolling. Some modules may have restricted enrollment.

Both semesters - 3 lecs and 3 labs per week.

BIOLOGY

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 3 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. Labs deal with basic techniques used in plant pathology, including fungal and bacterial isolation, identification and inoculation.

Winter semester - 2 lecs and 3 labs per week.

B41: Plant Physiology

Instructor: **TBA**

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 insect pests of the North-East. Anatomy, physiology, taxonomy, behaviour, and ecology of insects are considered during lectures and laboratory work. Discussions on the relation of insects to humans, basics of insect control methods, and pesticide safety are included.

Fall semester - 2 lecs and 2 labs per week.

Text - Romsoser and Stoffolane, *The Science of Entomology (3rd edition)*.

B44: Techniques for Biology Technologists I

Instructor: **Biology Faculty**

Coordinator: **Prof. Crosby**

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. Included are discussions on weed recognition and chemical and non-chemical approaches to controlling weeds in various agricultural 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.

B61: Techniques for Biology Technologists II

Instructor: **Biology Faculty**

Coordinator: **Prof. Crosby**

This course is available only to Biology Technology students. Techniques for Biology Technologists II is a continuation of Techniques for Biology Technologists 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 course 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 3 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

Instructor: **Prof. Olson**

An introductory course in plant biology. Topics discussed include 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 3 labs per week.

B110: Zoology

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 3 labs per week.

B200: Cell Biology

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.

B201: Cell Biology Laboratory (Pending program implementation)

Instructor: **TBA**

B201 combines the lectures of B200 with a laboratory section. Students will participate fully in B200 and, as well, complete laboratory sessions to complement lecture material. Students may receive credit for only one of B200 or B201.

Fall semester - 3 lecs and 3 labs per week. First offered 1999-2000.

B225: Microbiology

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

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.

B260: Plant Physiology

Instructor: **Prof. Percival**

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

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.

B270: Structural Botany

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 basic 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

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.
Offered in alternate years. Next offered in
1999-2000.

B320: General Entomology

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

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. Included are discussions on weed recognition, chemical and non-chemical approaches to controlling weeds in various agricultural 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

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 3 labs per week.

B350: Ecological Methods

Instructor: **Prof. 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, sampling design, and experimental design.

Fall semester - 3 lecs and 3 labs per week.

B355: Food Microbiology (A)

Instructor: **TBA**

Prerequisites: 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. The use of conventional plating as well as rapid assay techniques will be discussed.

Winter semester - 3 lecs and 3 labs per week.

B360: Environmental Analysis

Instructor: **Prof. Stratton**

Prerequisite: B225

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

Fall semester - 3 lecs and 3 labs per week.

B365: Environmental Impact

Instructor: **Prof. Stratton**

Prerequisite: B360 or CS305

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 3 labs per week.

B370: An Introduction to Molecular Genetics

Instructor: Prof. Atlin

Prerequisites: Introductory Genetics and one course in biochemistry

The objective of this course is to provide students with a general foundation in molecular genetics and recombinant DNA technology. Replication, transcription, protein synthesis, recombinant DNA, and the regulation of gene expression in prokaryotes and eukaryotes will be studied in detail. Ethical and legal issues related to the production, testing, and ownership of genetically-engineered organisms will be discussed. In the laboratory, students will be exposed to a range of molecular genetic techniques, including isolation and restriction site mapping of bacterial plasmids, bacterial transformation, isolation and restriction enzyme digestion of genomic DNA, and PCR amplification. Students completing this course will be able to read original research papers in the molecular genetic literature, and will be prepared for advanced training in molecular biology, plant breeding, or animal breeding.

Winter semester - 3 lecs and 3 labs per week.

Offered in alternate years. Next offered in 1998-99.

B375: Population and Quantitative Genetics

Instructor: Prof. Atlin

An introduction to population and quantitative genetics, with particular emphasis on the forces causing genetic change in populations. Contemporary ideas about evolution at the molecular and organismal levels will be explored. Theory underlying modern breeding methods will be introduced. Students completing this course will be prepared for advanced training in plant breeding, animal breeding, and evolutionary biology. Extensive use will be made of computer simulations to model populations under natural and artificial selection.

Winter semester - 3 lecs and 3 labs per week.

Offered in alternate years. Next offered in 1999-2000.

B385: Principles of Pest Management (A)

Instructor: Prof. Sampson

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 Pest Management major or Plant Science option.

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

B400: Soil Microbiology (A)

Instructor: Prof. Stratton

Prerequisites: B225, CS220

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

Fall semester - 3 lecs and 3 labs per week.

B405: Pesticides in Agriculture (A)

Coordinator: Prof. Sampson

Prerequisites: 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 photomicroscopy, DIBA for virus identification, ELISA for fungal identification, and advanced mycological techniques.

Winter semester - 2 lecs and 3 labs per week.

B421: Special Topics in Agrbiology I (A)

Instructors: Department of Biology Faculty

Prerequisite: 20 degree credits

An opportunity to study a special topic defined by an individual student, group of students or faculty. The course is conducted by tutorials, assigned readings, assignments and/or other appropriate activities. Special topics must be supervised by a faculty member and approved by the Department Head.

Fall or Winter semester - as arranged.

B422: Special Topics in Agrbiology II (A)

Instructors: Department of Biology Faculty

Prerequisites: 20 Degree Credits

A second special topics course provides additional

opportunity for students to individualize their programs with in-depth study of an approved topic. Although the second topic selected may be in a similar area of interest to that studied in B421, it must be sufficiently distinct to warrant additional study. Special topics must be supervised by a faculty member and approved by the Department Head.

Fall or winter semester - as arranged.

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.

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.

Winter semester - 3 lecs and 3 labs per week.

B449: Project-Seminar I (A)

Instructors: **Department of Biology Faculty**

Coordinator: **Prof. Gray**

An introduction to independent research and effective communication for final year students in Agribiology: Environmental Biology and Agribiology: Pest Management. 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 results in both oral and written form. The research topic and advisor(s) are chosen by the student in cooperation with the course coordinator.

Winter semester - 2 lecs and 3 labs in three two-period blocks.

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

B450: Project-Seminar II (A)

Instructors: **Department of Biology Faculty**

Coordinator: **Prof. 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 3 labs in three two-period blocks.

CHEMISTRY AND SOIL SCIENCE

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. Miller**

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. Robinson**

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**

This course will familiarize students with sampling techniques, sample preparation and analyses commonly used in the food industry. Students will also gain experience with some of the basic sensory methods used in the food industry.

Winter semester - 3 lecs and 3 labs per week.

CS42: Organic Chemistry

Instructor: **Prof. Payne**

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

Fall semester - 3 lecs and 3 labs per week.

CS43: Bio-Organic Chemistry

Instructor: **Prof. Payne**

Prerequisite: CS42

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

of the properties and reactions characteristic of the organic and biochemical compounds studied.

Winter semester - 3 lecs and 3 labs per week.

CS50: Introduction to Physical Chemistry

Instructor: **Prof. Merrin**

Prerequisites: CS100, MP100

An introductory course which includes a study of gas laws, kinetic theory of gases, thermodynamics, the liquid and solid states, phase changes, chemical equilibrium, nonelectrolyte solutions, colloids, electro-chemical cells, chemical kinetics, and photochemistry.

Fall 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 3 labs per week.

Texts - Shuger et al., *Chemical Technicians Ready Reference Handbook* (3rd edition); American Chemical Society, *Safety in Academic Chemistry Laboratories* (6th 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 3 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 3 labs per week.

CS75: Basic Food Chemistry

Instructor: **Prof. Hoyle**

Prerequisites: CS42, CS43

A study of the chemistry and technology of carbohydrates, fats, and proteins. Attention is

directed towards the basic principles involved in their determination in foods and feeds. The laboratory deals with the qualitative and quantitative physical and chemical techniques used in the analysis of foods and feeds.

Fall semester - 3 lecs and 3 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.

CS95: Practicum- Food Quality Technology

Coordinator: **Prof. Crowe**

This Food Quality practicum is designed to provide students with hands-on experience and instruction in a typical workplace setting. In their third year, students in the Food Quality Technology program will spend a minimum of 12 weeks in a full-time workplace experience in either an industry or a related quality control laboratory.

Fall semester.

CS99: Preparatory Chemistry

Instructor: **Prof. Payne**

Prerequisite: Approval of the Registrar and the Instructor.

This course is designed for students who satisfy all other requirements for admission but lack the required Grade 12 Chemistry course. The course will cover the basic materials necessary for entrance into CS100 including review of the Periodic Table, nomenclature, stoichiometry, and other topics as determined by a review of the class. CS99 is not intended to duplicate or replace Grade 12 Chemistry.

Summer - Contract Registry for specific dates.

CS100: Chemical Principles

Instructor: **Prof. Merrin**

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 3 labs per week.

CS110: Organic Chemistry

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 3 labs per week.

CS200: Biochemistry I

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 3 labs per week.

Text - Leninger, *Principles of Biochemistry*.

CS205: Biochemistry II

Instructor: **Prof. Merrin**

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 3 labs per week.

Text - Leninger, *Principles of Biochemistry*.

CS210: Advanced General Chemistry

Instructor: **Prof. Hoyle**

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 3 labs per week.

Offered in alternate years. Next offered in 1998-99.

CS215: Advanced Organic Chemistry

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 3 labs per week.
Offered in alternate years. Next offered in 1999-2000.

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 3 labs per week.

CS225: Quantitative Analytical Chemistry

Instructor: Prof. Merrin

Prerequisite: CS100

This course includes evaluation of analytical data; preparation of samples for analysis; wet chemistry methods; UV-visible spectro-photometry; and the use of an autoanalyzer.

Winter semester - 3 lecs and 3 labs per week.
Text - Underwood and Day, *Quantitative Analysis*

CS230: Introduction to Geology

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

Instructor: Prof. Merrin

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.

CS305: Instrumental Analytical Chemistry

Instructor: Prof. Crowe

Prerequisites: Recommend CS225, and either CS110 or CS42.

Introduction to the basic theory underlying important techniques in instrumentation chemistry. Design of instruments, operation, and applications will be studied. Laboratory work will include experiments in soils, plant and biological tissue, food, drugs, and vitamins. Instruments in the field of absorption and emission spectrophotometry, chromatography, and electrochemistry will be studied.

Fall semester - 3 lecs and 3 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 3 labs per week.
Text - Wang, Willis, Loveland, *Radiotracer Methods in the Biological, Environmental and Physical Sciences*.

CS320: Soil Fertility (A)

Instructor: Prof. Warman

Prerequisites: CS220

Preparatory: B260

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

Winter semester - 3 lecs and 3 labs per week.
Offered in alternate years. Next offered in 1999-2000.

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 3 labs per week.

Offered in alternate years. Next offered in 1999-2000.

CS335: Soil Physics (A)

Instructor: **Prof. Miller**

Prerequisites: IN100, IN101, 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 3 labs per week.

Offered in alternate years. Next offered in 1998-99.

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: **Prof. Crowe**

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 3 labs per week.

CS351: Food Chemistry (A)

Instructor: **Prof. Crowe**

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.

CS360: Mammalian Biochemistry

Instructor: **Prof. Robinson**

Prerequisites: AS230, CS205

A study of how basic biochemical principles are applied to gain insight into the molecular functions of the diverse mammalian organ systems. The subject matter is divided into three parts: (1) Body Fluids and Their Constituents, which includes such subjects as blood coagulation, the complement system, the immune system, and their control; (2) Specialized Tissues, such as connective tissue, nervous tissue, and muscle tissues; and (3) Biochemistry of the Endocrine System, with the focus on the principles of endocrine biochemistry and the mechanisms of hormone action. The topics covered include general principles and mechanisms of hormone action, prostaglandins, the thyroid gland, the gonads, as well as the hypothalamus, hypophysis, and adrenals.

Winter semester - 3 lecs per week.

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

CS370: Instrumental Food Analysis

Instructor: **Prof. Merrin**

Prerequisites: CS305, and CS110 or CS42

Corequisite: CS350

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

Winter semester - 3 lecs and 3 labs per week.

CS380: Food Quality Assurance

Instructor: **Prof. Crowe**

Prerequisites: CS110, MP100

The various quality philosophies (QC, QA, TQM) will be studied with respect to their industrial application. The course will center on the use of control charts to monitor processes and to evaluate the quality of both in-coming raw materials and the finished product. Students will gain first hand experience in the design and implementation of ISO 9000 and HACCP systems in the commercial food industry. The application of these principles to other manufacturing processes and/or data acquisition will be discussed. Consideration will also be given to recognizing the quality criteria required by some international customers.

Winter semester - 3 lecs and 3 labs per week.

CS415: Special Topics in Chemistry and Soil Science I (A)

Coordinator: **Prof. Hoyle**

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

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 3 labs.

Offered in alternate years. Next offered in 1998-99.

CS425: Special Topics in Chemistry and Soil Science II (A)

Coordinator: **Prof. Hoyle**

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.

Fall or winter semester - as arranged.

CS430: Soil Survey and Land Evaluation (A)

Instructor: **Prof. Brewster**

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 3 labs per week.

Offered in alternate years. Next offered in 1998-99.

CS440: Environmental Soil Chemistry

Instructor: **Prof. Warman**

Prerequisites: CS220

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 seminar-discussions integrate basic soil chemical principles with problems in waste disposal, metal contamination, nutrient leaching, pesticide degradation, etc.

Winter semester - 3 lecs and 3 labs per week.

Offered in alternate years. Next offered in 1999-2000.

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.

CS457: The Science of Composting and Its Application (A)

Instructor: **Prof. Warman**

Principles of compost production - to include the following factors: feedstocks, C:N, biological reactions, moisture, aeration, temperature, etc. Laboratory analysis of feedstocks and composts produced commercially and by the participants; evaluation of the process and bioavailability of nutrients in composts using growth room potting studies; environmental concerns - odour, organic and inorganic contaminants, pathogens and heavy metals.

Fall semester - 3 lecs and 3 labs per week.

Offered in alternate years. Next offered in 1999-2000.

ECONOMICS AND BUSINESS

EB10: Accounting

Instructor: **TBA**

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: **TBA**

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 and a computerized accounting project.

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: **Prof. Russell**

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: **TBA**

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**

Prerequisite: EB340

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 3 labs per week.

EB65: Business Project

Coordinator: **Prof. Tait**

An opportunity to examine, in detail, specific agricultural topics of interest. Projects are organized and carried out by the students under the supervision of various staff members.

Fall semester - 5 labs per week.

EB72: Farm ProjectCoordinator: **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 ProjectCoordinator: **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.

EB95: Practicum - Farming TechnologyCoordinator: **Prof. Tait**

The seven-month training takes place on a commercial production unit, where the student is under the direct supervision of the farmer. Emphasis

is placed on having the student involved in all facets of the operation, with particular attention to financial management. Each student is expected to take part in selecting his/her training farm. Whenever possible the farm will be in the province chosen by the student. The final grade in the course is based on the student's performance in several topic areas (financial, production and specific skills) as determined by both the farmer and the coordinator.

May to November at the end of the first year of the Farming Technology program.

EB110: Agricultural Economics (A)Instructor: **Prof. Dunlop**

This course is designed to introduce students to the structure and organization of agriculture and economic theory as it applies to agriculture. The course strives to make the agricultural reality more understandable for all students, regardless of major, and provides the necessary background for more advanced agricultural economics, agri-business and economics courses.

Fall and Winter semesters - 3 lecs per week.

EB200: Microeconomics IInstructor: **Prof. Stackhouse***Prerequisites:* EB110, MP100

Introduces the principles of neoclassical microeconomic theory using graphical and mathematical analysis. Areas of emphasis include: the competitive market model, measurement and interpretation of elasticities, the theory of consumer preferences, and the theory of production.

Fall semester - 3 lecs and 2 labs per week.

EB205: Microeconomics IIInstructor: **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 and 2 labs per week.

EB210: Financial Accounting IInstructor: **TBA**

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, computerized accounting software, 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

Instructor: TBA

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.

EB221: Topics in Economics and Business Management (A)

Instructors: Dept. of Economics and Business Faculty

Prerequisites: 10 degree or diploma credits

An opportunity for students throughout the College to study introductory topics defined by an individual student, group of students, or faculty.

The course is conducted by classes, tutorials, assigned readings, assignments and/or other appropriate activities. Topics must be supervised by a faculty member and approved by the Department Head.

Fall, Winter or Summer semester - as arranged.

EB220: Production Economics (A)

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 3 labs per week.

EB255: Macroeconomics I

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 and 1 tutorial per week.

EB260: Mathematical Economics

Instructor: Prof. Stackhouse

Prerequisite: 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, 1 tutorial and 2 labs per week.

EB305: Macroeconomics II

Instructor: Prof. Grant

Prerequisite: EB255

Development of an integrated aggregate model of the Canadian economy, which includes consideration of money, product, and labour markets, and aggregate demand and supply.

Fall semester - 3 lecs per week.

EB315: Management Accounting

Instructor: Prof. Russell

Prerequisite: EB210 or permission of the instructor.

This course introduces students to the use of accounting information in making effective management decisions. Topics include cost control and analysis, cost-volume-profit analysis, break-even, differential analysis and capital investment analysis.

Fall semester - 3 lecs and 2 labs per week.

EB320: Agricultural and Food Policy I (A)

Instructor: Prof. Dunlop

Prerequisites: EB110 and 20 Degree courses.

This course introduces students to the structure of the agrifood industry and the process of policy and implementation. A critical assessment of the institutions (organizations, programs, and policies) in agriculture is the main focus of the course. Through guest speakers, students' presentations, interactive class discussions and lectures, students will learn how policies are developed and who is involved in the policy development process. An historical appreciation for agricultural policy in Canada will be pursued with a critical assessment of these policies. In reviewing policy problems affecting the agrifood industry students will examine possible solutions to these issues. Topics covered include: reasons for Government intervention; historical development of agrifood policy in Canada; the policy process; players in agriculture and food policy; structure of provincial, federal, and cost-shared programs; consumers and food policy; resource and environmental policy; international agricultural and food policies; trade agreements; agribusiness involvement in agriculture

and food policy.

Winter semester - 3 lecs and 2 labs per week.

EB325: Operations Research

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

Instructor: **Prof. Whalen**

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 3 labs per week.

EB360: Econometrics

Instructor: **Prof. Clark**

Prerequisites: EB260, MP210

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

Instructor: **Prof. Clark**

Prerequisite: EB205

Advanced microeconomics applied to issues of environmental quality and resource use. Topics include welfare economics, market failure, externalities, pricing of renewable and non-renewable resources, and cost-benefit analysis.

Fall semester - 3 lecs per week.

EB410: Strategic Management in Agri-Business (A)

Instructor: **Prof. Whalen**

Prerequisites: Students will normally be Agricultural Business majors who have successfully completed the first three years of the program. Other students may seek permission of the instructor.

This is a capstone course that will integrate all the business disciplines (marketing, finance, accounting, etc.) and prepare the student to formulate and implement strategy in an agri-business setting. Students will be expected to gain a full understanding of the complexity and interrelationships of modern managerial decision making and apply this knowledge to real managerial problems. Lectures, case studies, projects and guest speakers will be utilized.

Fall semester - 3 lecs per week.

EB230: Introduction to Business Law

Instructor: **TBA**

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.

EB419: Agrifood Policy Analysis (A)

Instructor: **Prof. Dunlop**

Prerequisites: EB320, EB325, EB330, EB360

This course will focus on the economic analysis of agricultural and trade policy. This course is a capstone drawing on the different areas of study in agricultural economics. Students will learn how to synthesize economic theory with quantitative tools to solve agricultural and food policy problems. Use of the formal analytical methods of policy analysis is the main emphasis of the course. Students will read literature pertaining to policy problems and analysis;

will attempt their own analysis on policy issues; and critique the existing literature. Topics covered include: influential doctrines in agricultural policy; fundamentals of welfare theory; partial equilibrium analysis of agricultural and trade policy; social choice theory; basics of trade theory; export and import protection; and the political economy of agricultural and trade policy.

Fall semester - 3 lecs and 2 labs per week.

EB421: Special Topics in Agricultural Economics and Business I (A)

Instructors: **Department of Economics and Business Faculty**

Prerequisite: 30 Degree courses

An opportunity to study a special topic defined by an individual student, group of students or faculty. The course is conducted by tutorials, assigned readings, assignments and/or other appropriate activities. Special topics must be supervised by a faculty member and approved by the Department Head.

Summer, Fall or Winter - as arranged.

EB422: Special Topics in Agricultural Economics and Business II (A)

Instructors: **Department of Economics and Business Faculty**

Prerequisite: 30 Degree courses

A second special topics course provides additional opportunity for students to individualize their program with in-depth study of an approved topic. Although the second topic selected may be in a similar area of interest to that studied in EB421, it must be sufficiently distinct to warrant additional study. Special topics must be supervised by a faculty member and approved by the Department Head.

Summer, Fall or Winter - as arranged.

EB425: Research Methods (A)

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

Instructor: **Prof. Whalen**

Prerequisites: EB335 or permission of the 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 WTO, the IMF, 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.

Winter semester - 3 lecs per week.

EB435: Consumer Behaviour and Food Marketing (A)

Instructor: **Prof. Whalen**

Prerequisite: EB335 or permission of the 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.

Fall semester - 3 lecs per week.

EB440: Farm Management II (A)

Instructor: **Prof. Russell**

Prerequisites: EB325, EB340

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

Winter semester - 2 lecs and 3 labs per week.

EB445: Agribusiness Entrepreneurship (A)

Instructor: **Prof. Russell**

Prerequisites: EB335, EB340 and 20 Degree courses.
This course will apply the concepts of entrepreneurship to creating and managing a small business. Students will investigate opportunities for new agribusinesses and develop business plans which consider management structure, financing, production, marketing and taxation. Lectures, case studies, guest speakers and project assignments will be utilized.

Winter semester - 3 lecs and 3 labs per week.

EB450: Project-Seminar (A)

Instructors: **Department of Economics and Business 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

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 any H100 level course.

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 and required for students in the Animal Health Technology program.

Winter semester - 1 lec and 2 labs per week.

H60: Communication Techniques

Instructor: **Prof. Sanderson**

This 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 audiovisual 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.

Winter semester - 3 lecs per week.

H102: Nature in English and American Literature

Instructor: **TBA**

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.

Fall semester - 3 lecs per week.

H113: Composition

Instructor: **TBA**

This course has two primary objectives: to improve the student's basic writing ability and to offer training in research report writing. The structure of the course will consist of a lecture and a two-period tutorial. The tutorials will focus on enhancing grammar and spelling skills as well as furthering composition skills through essay writing. The lectures will teach students the structure of a research report with emphasis on paraphrasing and citing. The students will be required to write extensively throughout the term. A significant part of evaluation will be based upon written work done under examination conditions during tutorials.

Fall Semester - 1 lec and 1 tutorial per week.

H130: Introductory French

Instructor: **TBA**

Prerequisite: Grade 12 High School French or permission of the Instructor and Head of

Department.

This course is designed to provide the student with opportunities to actively use the language through various socio-cultural settings and language functions. As part of a communicative approach, a video production component centred on publicity will be integrated in the program.

A variety of culturally relevant authentic materials such as video recordings, audio-cassettes, guest speakers, and literature will be used to supplement the 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 minimum enrolment.

Fall semester - 3 lecs per week.

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 minimum enrolment.

Winter semester - 3 lecs per week.

H140: Personnel Management

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.

Both semesters - 3 lecs per week.

H150: Agriculture Today

Instructor: TBA

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

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

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.

H230: Nature's Image: A Survey of Landscape Art

Instructor: TBA

This course will provide an introduction to the history of art forms depicting landscape with the major focus being on landscape painting. The course will consist of both art history lectures and a studio component in which drawing techniques, collage, and colour theory will be explored. Students will develop skills in composition and will gain an increased appreciation for landscape art traditions.

Fall semester - 3-hour lecture/studio, once per week.

H320: Extension Education in the Rural CommunityInstructor: **Prof. Sanderson**

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 CommunicationsInstructor: **Prof. Sanderson**

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 audiovisual presentation with integrated sound track.

Winter semester - 3 lecs and 2 labs per week.

H350: Environmental and Agricultural EthicsInstructor: **TBA**

Prerequisite: Limited to third and fourth year degree students or by permission of Instructor and the Head of the Math, Physics and 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 SociologyInstructor: **Prof. Beesley**

Prerequisites: H160 and H101 or 102, 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 GeographyInstructor: **Prof. Beesley**

Prerequisites: H170 and H101 or 102, 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 IInstructor: **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 Math, Physics and Humanities Department faculty, but will present their seminars to a wider audience.

Fall Semester - Meeting schedule to be arranged.

H402: Humanities Research Seminar IIInstructor: **Humanities Faculty, as appropriate to research topics**

Prerequisite: 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 Math, Physics and Humanities Department faculty, but will present their seminars to a wider audience.

Winter semester - Meeting schedule to be arranged.

H403: Special Topics in Humanities

Instructors: **Humanities Faculty**

Prerequisites: 20 Degree Courses

An opportunity to study a special topic defined by an individual student, group of students or faculty. The course is conducted by tutorials, assigned readings, assignments and/or other appropriate activities. Special topics must be supervised by a Faculty member and approved by the Math, Physics and Humanities Department Head.

Fall, Winter, Summer - as arranged - 3 lecs per week.

INTERDEPARTMENTAL

IN100: Agricultural Ecosystems (A)

Coordinator: **Prof. Martin**

This course is an introduction to agriculture and food systems. The principles of agricultural production as studied in the disciplines of animal science, plant science, agricultural engineering and soil science will be integrated to give a comprehensive view of agricultural ecosystems. Course work will include lectures, laboratories, problem solving exercises, and small group work. There will be a farm tour for all IN100 students on Saturday, October 4, 1997, from 7:56 am until 5 pm. The course will expose students to issues and raise questions to be considered during the remainder of their undergraduate career.

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 values and ideas of others.

Fall semester - 3 lecs, 2 labs and/or tutorials per week.

IN101: Food Security (A)

Coordinator: **Prof. Fredeen**

This course is structured similarly to IN100. The emphasis will be on food security and recycling resources. Topics will include global population, food production and distribution; globalization of agricultural trade; agricultural ethics; and rural sustainability. Course work will include lectures, laboratories, problem solving exercises, and small group work. The course will expose students to issues and raise questions for students to answer during the remainder of their undergraduate career.

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 values and ideas of others.

Winter semester - 3 lecs, 2 labs and/or tutorials per week.

IN205: Food Systems in the Tropics (A)

Coordinators: **Profs. Asiedu and Russell**

This course examines tropical food systems with particular reference to Jamaica in the West Indies. Students will learn about farming systems, tropical crops, and livestock, business structures of tropical agriculture, producer organizations, marketing, financing, trade, government involvement in food systems and the consumer. Field trips to various agri-industry operations will be undertaken.

This intensive two-week course is offered in Jamaica at the College of Agriculture, Science and Education. Additional fees for travel, meals and accommodation apply.

Semester - Spring (subject to enrolment)

IN390: Microbial Math, Physics and Humanities Department (Pending program implementation)

Instructors: Prof. Blanchard and TBA

Prerequisites: Minimum mark of 75% in each of B201, B225, B240, and CS205

A study of the various techniques required for employing microbial systems in Math, Physics and Humanities Department applications. Topics covered will include fermentation kinetics, culture systems, fermenter control, scale-up concerns, and some specific applications, such as the use of microbial systems in bioremediation, waste disposal, and as biological pesticides or fertilizers. Laboratory classes will be integrated and material covered in other Math, Physics and Humanities Department courses.

Fall semester - 3 lecs and 3 labs per week.

First offered 1999-2000.

IN395: Applied Biochemistry (Pending program implementation)

Instructors: TBA

Prerequisite: Minimum mark of 75% in each of B201, B225, B240, and CS205*Co-requisite:* IN390

Application of different analytical techniques to the detection, extraction, purification and characterization of biological compounds. Current strategies in development of diagnostic kits and scaling-up purification procedures (downstream processes) based on biochemical principles will also be part of this course. Laboratory part of this course will be integrated with material covered in other Math, Physics and Humanities Department courses.

Fall semester - 2 lecs and 4 labs per week. First offered 1999-2000.

IN475: Advanced Biochemistry (Pending program implementation)

Instructor: TBA

Prerequisites: B201, IN395

An overview of principles of metabolic control and exploitation of multi-enzyme systems in Math, Physics and Humanities Department. Biological half life, signal transduction and expression, assembly and post-translational modification of regulatory enzymes will be the main focus of this course. Laboratory training will be integrated with material covered in lectures.

Winter semester - 3 lecs and 3 labs per week.

First offered 1999-2000.

IN400: Issues in Agriculture (A)

Coordinators: TBA

Prerequisite: Third- or fourth-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 Math, Physics and Humanities Department, the occupation of farming, animal welfare, etc. Students will be given weekly required readings.

Fall semester - 3-period seminar weekly. Offered in alternate years. Next offered in 1998-99.

IN475: Biotechnology in Agriculture (A)

Instructor: Prof. Nowak

Overview of current developments in the application of biotechnology techniques to agriculture and related fields and their impact or potential impact on plant and animal production, food and feed quality, and bio-resource and waste management will be the main focus of this course. Seminars and class discussions will address socio-economic, environmental and ethical considerations. Each student will give two seminars and write an essay on an assigned topic.

Winter semester - 2 lecs and 3 seminars per week. Offered in alternated years. Next offered in 1999-2000.

IN449: Agricultural Biotechnology Project-Seminar I (A) (Pending program implementation)

Instructor: TBA

Prerequisite: 5 semesters in AgBiotech Major
AgBiotech Majors in their third year will select, in consultation with a faculty advisor, a research topic. The topic will be investigated and reported orally and in a written report. Other topics of current interest will also be presented and discussed in the weekly seminar period. This is part one of the two semester series IN449 - IN450.

Winter semester - 2 seminars per week. First offered 1999-2000.

IN450: Agricultural Biotechnology Project-Seminar II (Pending program implementation)

Instructor: TBA

Prerequisite: IN449

A continuation of IN449.

Winter semester - 2 seminars per week. First offered 1999-2000.

MATHEMATICS AND PHYSICS

MP14: Computational Methods

Instructor: **Prof. Farmer**

A course to develop problem-solving and decision-making abilities and computational skills. 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: measurement, dynamics, statics, materials and optics. The laboratory sessions consist of student-performed experiments and problems tutorials.

Fall semester - 3 lecs, 2 labs, and 1 tutorial per week.

Text: Introductory Physics, available at NSAC Bookstore

MP70: Basic Statistics

Instructor: **TBA**

Methods for data summary and presentation; measures of centre and variation; graphic exploration of relationships between variables; transformation (purpose and commonly used transformations): the t-, F- and χ^2 - distribution; basics of statistical inference for 1 and 2 means; one way ANOVA (running, interpreting results and means comparison). Students will learn to use PC SAS.

Winter semester - 3 lecs and 2 labs and 1 tutorial per week.

MP75: College Intermediate Algebra

Instructor: **TBA**

This course is designed for students needing to strengthen their background in mathematics. It begins with a review of algebra, the use of variables, solutions of equations and inequalities, working with exponents and basic graphing techniques. Emphasis will be placed on the use of mathematics to solve application problems appropriately related to agriculture. This is a non-credit course.

Fall semester - 3 lecs and 1 tutorial per week.

MP85: Functions

Instructor: **TBA**

Prerequisite: MP75, if required as a result of performance on a mathematics diagnostic test. This is a one-semester course (which is in effect the second half of the MP75/MP85 sequence) designed for those who do not have the requisite skills for the first-year mathematics courses but have shown sufficient basic mathematical ability to warrant a one-semester course to make up for the deficiencies. This course will emphasize the study of the basic functions used in the sciences. This is a non-credit course.

Both semesters - 3 lecs and 1 tutorial per week.

MP90: Introductory Physics

Instructor: **TBA**

An introductory course for entering students who do not have the equivalent of Nova Scotia Grade XII Physics. Course topics include dynamic, statics, fluids, and heat. A non-credit course.

Winter semester - 2 lecs and 2 tutorials per week.

MP100: Calculus and Analytic Geometry I

Instructors: **Profs. Madigan and Georgallas**

Prerequisite: University Preparation Grade XII Mathematics (N.S. 441, N.B. 121 or 122 or MP85). 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 MP85.

Fall and Winter semesters - 3 lecs and 1 tutorial per week.

MP105: Calculus and Analytic Geometry II

Instructors: **Profs. Madigan and Georgallas**

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.

Fall and Winter semesters - 3 lecs and 1 tutorial per week.

MP140: Physics I

Instructor: **Prof. Pearson**

Prerequisite: University Preparation Grade XII Physics

121 or 122) or NSAC MP90.

Fundamental physical principles which are necessary for the understanding of the agricultural sciences form the core material of this course. Classical physics topics include vector analysis, dynamics, statics, fluid mechanics, acoustics and heat.

Concepts derived from modern physics are added in order to complete the classical theories. Weekly student laboratory sessions allow for direct investigation of the theories studied in the course.

Both semesters - 3 lecs and 1.5 hours lab per week, 1 optional tutorial per week.

Text - Haliday, Resnick and Walker, *Fundamentals of Physics*, 5th Edition, Volume 1. (Students in Engineering should purchase the combined volume which will also be used in MP145.).

Students may take *either* MP140 *or* MP150 *but not both* for credit.

MP145: Physics II

Instructor: **Prof. Pearson**

Prerequisite: MP140

A continuation of Physics I MP140. The majority of the course deals with electromagnetic theory including such topics as: electric charges, fields, potential, magnetic theory, induction and Maxwell's Equations. Fundamental wave theory and optics are also studied together with an introduction to nuclear physics. The laboratory provides an opportunity to investigate the theories in a hands-on environment.

Winter semester - 3 lecs and 3 labs per week.

Text - Haliday & Resnick, *Fundamentals of Physics*, 4th Edition, Volume 2, Extended.

MP150 Biophysics I

Instructor: **Prof. Georgallas**

Prerequisite: University Preparation Grade XII Physics (NS 441, NB 121 or 122) or NSAC MP90.

In this course an understanding of Physics is acquired by exploring the physical principles which underlie complex biological structures. The nature of materials and the forces which act on them is introduced through a series of topic examples taken from evolution, mammalian physiology, plant structure and others.

Fall semester - 3 lecs per week 1 1/2 hours per week lab/tutorial (alternating weekly).

Students may take *either* MP140 *or* MP150 *but not both* for credit.

MP210: Introduction to Statistics

Instructor: **Prof. Astatkie**

An introduction to the basic statistical concepts of data summarization, probability, random variables, estimation and hypothesis testing of parameters from discrete and continuous probability distributions. These concepts will be applied to

problems from agricultural, biological and environmental research.

Fall and Winter semesters - 3 lecs, 1 tutorial and 1 computer lab per week.

MP211: Introduction to Planned Studies: Surveys and Experiments

Instructor: **Prof. Astatkie**

Prerequisite: MP210

This course is a continuation to MP210. Topics covered include sampling techniques, simple and multiple linear regression, analysis of variance for completely randomized and randomized block designs, nonparametric tests and introduction to categorical data analysis.

Fall semester - 3 lecs, 1 tutorial and 1 computer lab per week.

MP212: Probability and Statistics for Engineering

Instructor: **Prof. Pearson**

This is a calculus-based first course in probability and statistics which is designed to interact with the major disciplines within engineering. Topics include: descriptive statistics, mathematics of probability, random variables and probability distributions, estimation, hypothesis testing, linear regression and correlation and introduction to analysis of variance. Problem-solving skills in material related to engineering will be emphasized.

Winter semester - 3 lecs, 1 tutorial and 1 lab per week.

Text - Devore, *Probability and Statistics for Engineering and the Sciences*, 4th Edition

MP220: Computer Science

Instructor: **Prof. Bishop**

Introduction to problem-solving methods and algorithm development. Emphasis is on designing, coding, debugging, and documenting programs, using C.

Fall semester - 3 lecs and 2 labs per week.

MP222: Computer Methods

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.

Fall and Winter semesters - 3 lecs and 2 labs per week.

MP230: Multivariable CalculusInstructor: **Prof. Madigan***Prerequisites:* MP100, MP105

This course covers functions of several variables; vectors; space curves; partial derivatives; optimization; multiple integrals and their applications; vector fields; line integrals; flux integrals; divergence and curl; Stokes Theorem and the Divergence Theorem.

Fall semester - 4 lecs and 2 labs per week.

MP236: Differential EquationsInstructor: **Prof. Madigan***Prerequisites:* MP100, MP105

This course introduces the basic theory of differential equations, considers various techniques for their solution, and looks at various applications. Topics include First Order Linear and Non-Linear differential equations; differential equations of higher order; Laplace Transforms; Series solutions; systems of equations; and Fourier Series. Topics from Linear Algebra are included as required.

Winter semester - 4 lecs and 2 tutorials per week.

MP250: Biophysics II: PerceptionInstructor: **Prof. Georgallas***Prerequisite:* MP140 or MP150

In this course the physical principles underlying perception throughout the animal kingdom are introduced. The examples chosen emphasize adaptation and strategies (e.g. echolocation and noctuid moths) and represent a wide range of forms (e.g. eyes of the common scallop *pecten*, electric location by the fish *Gymnarchus niloticus*).

Winter semester - 3 lecs per week, 1.5 hours per week lab/tutorial (alternating weekly).

MP330: AgrometeorologyInstructor: **TBA***Prerequisite:* MP140 or MP150

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.

Offered in alternate years. Next offered in 1999-2000.

MP420: Intermediate Statistical MethodsInstructor: **Prof. Astatkie***Prerequisite:* MP210, MP211 or with permission of

instructor.

Analysis of single-factor experiments, randomized blocks, latin squares, factorial and two-level fractional factorial designs.

Fall semester - 3 lecs and 1 computer lab per week.

MP460: Agricultural ModellingInstructor: **Prof. Georgallas***Prerequisites:* MP105 and permission of the instructor.

The aim of the course is to teach agricultural students when and how to attempt to express their ideas mathematically, how to solve the resulting mathematical model and compare its predictions to experimental data. Topics include techniques of creating a model, techniques of solving models, testing and evaluating models, growth models and a directed study project of an example of a model used in the agricultural sciences.

Winter semester - 3 lecs and 1 tutorial 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.

Fall semester - 3 lecs and 2 labs per week.

Text - Barden, Halfacre and Parish, *Plant Science*.

PS36: Field Crops

Instructor: **TBA**

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, greenhouse vegetables and herbs. The laboratory section of this course includes visits to commercial greenhouse operations.

Fall semester - 3 lecs and 2 labs per week.

PS43: Small Fruit Crops

Instructor: **Prof. Ju**

Berry crops studied include strawberries, raspberries, cranberries, blueberries, currants, gooseberries, 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 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 3 labs per week.

PS51: Residential Landscape Design and Construction

Instructor: **TBA**

Prerequisites: AE101, 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. Students are taught both computer and conventional drafting to facilitate their design work.

Winter semester - 3 lecs and 3 labs per week.

Text - Hannebeum, *Landscape Design*.

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: **Prof. Olson and TBA**

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: **TBA**

Landscape plant materials, narrow-leaf and broad-leaf evergreens and annual bedding plants are studied. The recognition of deciduous trees by their winter wood characteristics is also covered. Sketching of deciduous and evergreen plants will be covered.

Winter semester - 3 lecs per week.

Text - Dirr, *Manual of Woody Landscape Plants*.

PS62: Landscape Plant Materials III

Instructor: **TBA**

During the fall semester herbaceous plants are studied with respect to their identification and landscape use. This includes annuals, perennials, ferns, grasses, spring and summer flowering bulbs. Additional cultivars of woody landscape species will be studied.

During the winter semester the winterwood of deciduous trees and shrubs is studied with respect to plant identification. Foliage plants for interior plantscapes will be studied as well as aquatic plants and additional woody plant cultivars. This course involves self-directed study.

Fall and Winter semesters - 1 lec per week.

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.

Fall and Winter 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 12 weeks (480 hours). 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 - 12 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 3 labs per week.

Text - Lily, *Tree Climbers Guide*

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. Plant health care strategies, including 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.

Text - Hiratsuka et al, *A Field Guide to Forest Insects and Diseases of the Prairie Provinces*.

PS73: Landscape Horticulture II

Instructor: TBA

Prerequisites: PS51, PS61

A study of herbaceous plants and their uses in landscape. Special plant groups, gardening techniques and styles will be examined. Both computer and conventional methods of drafting will be utilized in design.

Fall semester - 3 lecs and 2 labs per week.

PS74: Landscape Design and Construction

Instructor: TBA

Prerequisites: PS51, PS61

Advanced landscape planning and construction will be discussed. Such topics as site, furniture, decks, roofscapes, interior plantscapes, and estimating are included. Both computer and conventional methods of drafting will be utilized in design.

Winter semester - 3 lecs and 3 labs per week.

PS76: Plant Products Physiology

Instructor: Prof. Asiedu

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. Post-harvest handling systems and value-added products through minimal processing and packaging are examined. 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.

Fall and Winter semesters - 2 lecs per week.

PS147: Farm Woodlot Management (A)

Instructor: TBA

This course has limited enrolment. Steel-toed boots and hard hats are required by law.

The importance of forestry to Canada and the Atlantic Provinces is explained. Illustrated and explained are management procedures and practices for: the inventory of standing and felled trees, the establishment of new stands of trees, the tending of stands and plantations, and the harvesting of mature trees are illustrated and explained. Special attention is given to production of fuelwood, sawlogs, Christmas trees, maple sap, road construction and wildlife.

Fall semester - 3 lecs and 3 labs per week.

PS200: Vegetable Production (A)

Instructor: Prof. Goodyear

Preparatories: IN100, IN101, or PS30

Production technology for the major vegetables grown in the Atlantic region are studied in detail, including botanical and horticultural characteristics, soil and fertility requirements, cultivar selection, pest management, harvest and storage requirements. Commercial vegetable enterprises are visited.

Fall semester - 3 lecs and 2 labs per week.

PS210: Principles of Organic Horticultural Crop Production (A)

Instructor: Prof. Goodyear

Preparatories: 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.

PS270: Landscape Horticulture Work Program I

Instructor: TBA

This is a Spring semester course. Students are required to work under contract in the landscape horticulture trade with an approved employer for a period of at least 12 weeks (480 hours) minimum. Contract content may include such areas of work as landscape construction design and maintenance, plant production, turf maintenance, plant sales.

The content of the contract will reflect the specialities of the employer. Available only to B.Tech (Land Hort.) students.

Spring Semester (12 weeks).

PS290: The British Garden

Instructor: **Prof. Goodwin**

The history of British landscape development is studied, supported by visits to gardens which exemplify period design. Period garden features and the design philosophy that fostered the evolution of landscape development will be discussed. The maintenance and management of these landscapes will be examined. North American and British Landscape maintenance standards and techniques will be compared. Plant identification will be a component of this course. This course involves self-directed study. Expenses associated with the course are the responsibility of the student. The course is offered in England, subject to enrolment.

Summer semester - 4 weeks intensive.

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.

Fall semester - 3 lecs and 2 labs per week.

Offered in alternate years. Next offered in 1999-2000.

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. Next offered in 1998-99.

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. Next offered in 1999-2000.

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. Next offered in 1998-99.

PS325: Potato Production (A)

Instructor: **Prof. Asiedu**

Preparatory: B260

History, biosystematics, and ecophysiology of the crop are reviewed. Seed selection and manipulation, planting and crop management, postharvest handling and storage practices are studied in detail. Soil fertility, crop health management strategies and nutritional qualities are covered. Biotechnology applications to cultivar development, maintenance and multiplication are also outlined. Production practices for seed, table and processing stock and marketing in Atlantic Provinces are examined in detail and some commercial operations visited.

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. Next offered in 1999-2000.

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.

Winter semester - 3 lecs and 2 labs per week.

Offered in alternate years. Next offered in 1998-99.

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. Next offered in 1998-99.

PS355: Tropical Agriculture (A)

Instructor: **Prof. Asiedu**

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

Fall semester - 3 lecs per week *or*

Spring semester - 2 weeks intensive in Jamaica.

Students are responsible for expenses associated with the course. (Spring offering subject to enrolment).

PS360: Landscape Horticulture Project I

Coordinator: **TBA**

This course requires the student to select an appropriate project plus a faculty advisor in consultation with the course coordinator. A project implementation plan will then be prepared. The projects may vary considerably in nature. Available only to B.Tech (Land Hort.) students.

Fall semester - 1 lec per week.

PS370: Landscape Horticulture Work Program II

Instructor: **TBA**

This is a spring semester course. Students are required to work under contract in the landscape trade. The type of employment must be different than that experienced in previous work experience

courses. Available only to B.Tech (Land Hort.) students.

Spring semester - 12 weeks.

PS380: Landscape Construction and Estimating

Instructor: **TBA**

This is an advanced course in landscape design, construction and estimating. Large landscape projects will be utilized. Principles and processes for cost estimating will be studied. Computers will be utilized in the process.

Fall semester - 3 lecs per week.

PS390: Insects and Disease of Landscape Plants

Instructor: **Prof. Smith**

The objective of this course is the study of the common insects and diseases of concern in the urban forest and ornamental trade in Atlantic Canada. For each taxa reviewed, signs, symptoms (distant, close and detailed), life cycle, life habits, hosts, range, monitoring methods, and management are considered through an integrated approach. Group learning may involve case studies of important insects and diseases. Also discussed are symptoms caused by abiotic factors.

Winter semester - 3 lecs and 2 labs per week.

PS400: Plant Breeding (A)

Instructor: **Prof. Atlin**

Prerequisites: B240, MP210, one crop production subject

An introduction to the principles and practices of plant breeding, including the genetics of agriculturally important traits, germplasm conservation, breeding bio-technology, and the structure of the Canadian seed industry.

Winter semester - 3 lecs and 2 labs per week.

Offered in alternate years. Next offered in 1999-2000.

PS405: Agronomy (A)

Instructors: **Prof. Caldwell**

Prerequisites: PS300, PS305, 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)

Instructor: **Prof. Daniels**

Prerequisites: PS415 and three horticultural production courses.

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

Winter semester - 3 lecs per week.

PS415: Crop Adaptation (A)

Instructor: **Prof. Caldwell**

Prerequisites: One crop production course

Preparatory: B260, B330

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 economic and environmental responsibilities.

Fall semester - 3 lecs per week.

Texts - Gardner et al., *Physiology of Crop Plants*.

PS421: Special Topics in Plant Science I (A)

Instructors: **Department of Plant Science Faculty**

Prerequisite: 20 Degree credits

An opportunity to study a special topic defined by an individual student, group of students or faculty. The course is conducted by tutorials, assigned readings, assignments and/or other appropriate activities. Special topics must be supervised by a faculty member and approved by the Department Head.

Fall, Winter or Summer Semester - as arranged.

PS422: Special Topics in Plant Science II (A)

Instructors: **Department of Plant Science Faculty**

Prerequisite: 20 Degree credits

A second special topics course provides additional opportunity for students to individualize their program with in-depth study of an approved topic. Although the second topic selected may be in a similar area of interest to that studied in PS421, it must be sufficiently distinct to warrant additional study. Special topics must be supervised by a faculty member and approved by the Department Head.

Fall, Winter or Summer Semester - as arranged.

PS440: Management of Specialized Turf

Instructor: **Prof. Daniels**

Prerequisites: PS47 or PS340

Planning, designing and implementation of various management strategies for specific turfgrass situations will be studied. Range of specialized turf will include moderate to intensively managed athletic fields, golf courses and lawn bowling

establishments.

Fall semester - 2 lecs and 3 labs per week.

Offered in alternate years, next offered in 1998-1999.

PS449: Plant Science Project-Seminar I (A)

Coordinators: **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)

Coordinators: **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.

PS460: Landscape Horticulture Project II

Coordinator: **TBA**

This course requires the student to select an appropriate project plus a faculty advisor in consultation with the course coordinator. A project implementation plan will then be prepared. The projects may vary considerably in nature. The project could be a site analysis, a design, a maintenance calendar, a construction or maintenance estimate (cost) analysis, a nursery propagation or production study. Available only to B.Tech (Land Hort.) students.

Fall semester - 1 lab per week.

PS470: Tree Management

Instructor: **Prof. Goodwin**

Prerequisite: PS71

The focus of this course is on the management of the urban forest. Tree inventory systems, planning the urban forest, landfill site reclamation, and the value of urban trees will be included. Lab exercises will include climbing and pruning, flexible cable installation and tree assessment. Enrollment restricted; preference given to B.Tech (Land Hort.) students.

Fall semester - 3 lecs and 4 labs per week.

PS475: Plant Biotechnology (A)

Instructor: **Prof. Nowak**

This course has limited enrolment.

Theoretical bases of plant tissue culture, overview of the organization and operation of a tissue culture laboratory and tissue culture techniques and their application to nuclear seed potato production, multiplication of horticultural crops and landscape plant material, production of secondary metabolites, germplasm development and plant breeding and conservation of genetic resources. Outline of the techniques of manipulation of plant genome will also be a part of this course. Students must complete an assigned project.

Winter semester - 2 lecs and 4 labs per week.

Offered in alternate years. Next offered in 1998-99.

Text - Lindsay and Jones, *Plant Bio- technology in Agriculture*; Debergh and Zimmerman, *Micropropogation, Technology and Application*.

GRADUATE PROGRAM

MASTER OF SCIENCE IN AGRICULTURE

The Master of Science in Agriculture represents a unique cooperative 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.

BIOLOGY

Waste Management
Ecology
Plant Pathology

Environmental Microbiology
Pest Management
Botany - pollination studies

CHEMISTRY

Agricultural Chemistry
Food Science

SOIL SCIENCE

Soil Chemistry
Soil Physics
Soil Fertility

Nutrient Management
Geology

ANIMAL SCIENCE

Nutrition
Genetics & Breeding
Physiology

Animal Behaviour
Animal Product Technology
Animal Management

PLANT SCIENCE

Crop Physiology
Plant Biotechnology

Crop Breeding
Crop Management

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. Application forms and details may be obtained from:

NSAC Research & Graduate Studies Office
Cumming Hall
Nova Scotia Agricultural College,
Truro Nova Scotia B2N 5E3
Phone (902) 893-6360
FAX (902) 897-9399

English Language competency:

Non-Canadian candidates whose native language is other than English must demonstrate their capacity to pursue a graduate-level program in English. Such candidates should submit the results of a TOEFL or other standard English competency test at the time of application. The Program sets a minimum acceptable score of 580 for the TOEFL.

STARTING 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 DATES

The final date for the receipt of applications for studies commencing:

September 1 isJune 1
(Non-Canadian StudentsApril 1)
January 2 isOctober 1
(Non-Canadian StudentsAugust 1)
May 1 isFebruary 1
(Non-Canadian StudentsDecember 1)

PROGRAMS OF FULL-TIME AND PART-TIME STUDY:

M.Sc. (Regular)

Ten graduate credits are required. The thesis may count for a maximum of six. The remaining credits (pass grade 70% in each course) must include

AG570 (Communication Skills and Graduate Seminar) and AG571 (Graduate Module course).

M.Sc. (Extended)

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

DEGREE REQUIREMENTS

Length of Program and Extensions

Usual Time Limits for the completion of degrees are:

- M.Sc. (Regular) full-time: 2 - 3 years
- M.Sc. (Regular) part-time: 4 - 5 years

A program may be extended for one year beyond the Usual Time Limits set out above without formal approval. Students will be formally notified of this extension by the Graduate Coordinator. Requests for further extensions, to a maximum of 3 years beyond the Usual Time Limits, must be submitted to the Graduate Coordinator with a Report of Progress in the previous year together with a detailed plan and timetable for completion of the thesis. If supported by the Supervisory Committee, the Graduate Coordinator will forward the recommendation to the Dean of Graduate Studies for approval.

Graduate Courses

Graduate courses are numbered in the 500 series. No course can be assigned a graduate number without the recommendation of the Curriculum Committee and the approval of Faculty Council (NSAC) and the Faculty of Graduate Studies (Dalhousie University).

Letter of Permission

The maximum number of courses taken outside of the NSAC shall normally be confined to 25 per cent of the course requirements. Classes approved by Dalhousie University (after examination of class descriptions) can be taken at other universities on "Letter of Permission" as part of the graduate degree program provided the class is not available at the NSAC. Approval of the Letter of Permission is granted by the Dean of FGS, Dalhousie University. Full-time and part-time students are eligible to apply to take a class on a letter of permission. Students may not take classes outside of the NSAC/Dalhousie M.Sc. Program for graduate credit unless prior approval of a Letter of Permission has been received from the Faculty of Graduate Studies,

Dalhousie University. Letters of Permission are not approved retroactively.

Ancillary Courses

A student may be directed by his/her Supervisor or Supervisory Committee to take courses that are ancillary in nature to the student's specific area of study. These are taken by the student for credit in order to make up deficiencies in background or to acquire important skills of an ancillary nature. The pass grade on these ancillary courses is 60%. Ancillary credits are not used in calculating the number of graduate credits accumulated for the M.Sc. Degree.

Audit Courses

Students may elect or may be required to audit additional courses during their M.Sc. studies. A maximum of two courses per year are allowed without the payment of additional fees.

Passing Grade for Required Courses

All courses (graduate or undergraduate) not designated "audit" or "ancillary" at the admissions interview are "required" and must be passed with a grade of **at least 70%**. Courses in which a student fails to obtain this grade may not be reclassified as "audit" or "ancillary" at the end of semester.

Failed Courses

Failure to obtain the minimum grade in any course disqualifies a student from further graduate study and from graduation. Students who wish to continue in the graduate program must apply immediately to the Dean of Graduate Studies of Dalhousie University whose permission is required for a continuance.

COURSE SELECTION AND ENROLMENT

Selecting a Program

Students should meet with their Supervisor before classes begin and design a complete program of suitable courses for each year of study. It is the student's responsibility to arrange this meeting. An interim supervisor will be assigned to students who have not yet chosen a thesis topic and therefore do not have a formal supervisor. In selecting appropriate courses, the student must bear in mind the following:

- (i) All graduate students must enroll for Thesis Research every semester though they may expect to make little progress in that semester.
- (ii) Students in the M.Sc. (Regular) program are encouraged strongly to take all course work during their first year. However, if necessary,

courses may be spread over more than one academic year.

- (iii) Graduate credit is obtained only for graduate courses, which are denoted by a 500 number or above.

OTHER PROGRAM COMPONENTS

Admission to Candidacy (ATC) Examination

Each student must pass an Admission to Candidacy examination early in their program, normally within the first four to six months in which a student is registered. Students in the M.Sc. (Extended) or part-time program may elect to delay the candidacy examination for up to one year beyond the usual time. A Research Proposal must be prepared by all students as a requirement for the ATC examination. It should be submitted, together with a Research Proposal Information Form, to the Graduate Coordinator who will schedule the ATC examination. Additional copies must be provided to the Supervisory Committee by the student at least two weeks prior to the ATC examination, although a minimum of three weeks is preferred. A more detailed description of the ATC examination can be found in the Graduate Program Procedures manual available from the Research & Graduate Studies Office (Cumming Hall).

Thesis

A satisfactory thesis embodying contributions to research must be presented and successfully defended in a public oral examination. Thesis manuscripts must be prepared in accordance with the guidelines established by the Faculty of Graduate Studies, Dalhousie University.

Demonstrating

Each graduate student must teach or assist in teaching at least one undergraduate course. This requirement will be waived if satisfactory evidence of previous teaching experience is submitted to the Graduate Coordinator, who will consult with the VP Academic.

Language or Auxiliary Skills

Reading knowledge of a foreign language or skill in an auxiliary field such as electronics or computer programming may be required of the student by the Faculty Advisor or Supervisory Committee.

REGISTRATION

Registration Procedures

It is the student's responsibility to register on the day(s) specified for graduate student registration. To register all graduate students must each year:

(i) Contact the Graduate Coordinator to schedule a student interview with the Graduate Coordinator to complete the relevant forms that indicate the student's presence on campus and intention to study for a graduate degree during the ensuing year. The student will be required to provide the following information at the student interview: 1) identify his/her Faculty Advisor and proposed Supervisory Committee members, and 2) provide a list of courses, approved by the students' Faculty Advisor as necessary to complete the students' M.Sc. requirements.

The Graduate Coordinator will assist the student in the formal completion of a **Course Approval Form** and a **Graduate Program form**. The completed forms will be submitted by the Graduate Coordinator to the NSAC Registrar and the Dalhousie Dean of Graduate Studies, respectively. Any change in courses after the interview must be approved by the Supervisor and the Graduate Coordinator; a **Course Change Form** is required by the Registrar and a **Program Change Form** is required by the Dean of Graduate Studies.

(ii) Arrange for medical insurance coverage. (Forms available from the Graduate Coordinator).

(iii) Arrange for payment of fees. Note that:

- a) full fees must be paid for one year in the regular program and at the beginning of each year of the two years in the extended program;
- b) students who have completed all course work requirements pay reduced fees (thesis only fees) and should register in the correct category; e.g., students in the full-time M.Sc. (Regular) Program pay full fees for one year and may register for "thesis only" in subsequent year or years.

(iv) Obtain a student ID card.

Late registration is permitted until the last day for adding courses, as outlined in the NSAC Calendar.

Any student who fails to register within the prescribed periods, may neither submit a thesis nor obtain any services from the College during that semester.

Identification Cards

Full-time and part-time students will receive ID cards entitling them to NSAC and Dalhousie

University services, including library services at both institutions.

Advanced Standing

Graduate courses completed before admission to graduate studies and not credited to another degree may be presented at the time of admission for consideration for credit towards the degree sought. Courses taken during a qualifying year are not included in this category. The maximum number of graduate courses taken prior to registration in the M.Sc. Program and to be granted advanced standing is normally confined to 25 per cent of the course requirements.

Leave of Absence

Students who need to take leave from their program of study may apply in writing through the Graduate Coordinator for a "leave of absence." If the College recommends to the Faculty of Graduate Studies, Dalhousie University that the leave of absence be granted, and if the Faculty of Graduate Studies is also satisfied that the need is justified, such leave will be granted for a period of between four and twelve months commencing September 1 or January 1. An official leave of absence does not count towards time in the program. Students may not hold stipends or scholarships during a leave of absence. Applications for leave of absence (normally limited to one leave period) must be made by August 31 for a leave commencing September 1 and December 20 for a leave commencing January 1. A leave of absence not only frees the student from the necessity of paying tuition fees, it also releases the College from the obligation to provide the student with services. These include consultations with professors and student library and computer privileges. Under no circumstances will retroactive approval be given for leaves of absence.

Withdrawal From Program

A student who decides to withdraw from graduate studies must notify, in writing, his/her supervisor and the Graduate Coordinator. The Graduate Coordinator will notify the NSAC Registrar, the Dalhousie Registrar, and the Dean of the Dalhousie Faculty of Graduate Studies. Refund of fees, if applicable, will be calculated from the date this letter is received by the Graduate Office.

Required Withdrawal

A student may be required to withdraw from the program for a breach of a College regulation. The student will be notified by the VP Academic of the reason for the required withdrawal. The student has the right to appeal the decision to the Graduate Coordinator.

Registration Categories

A full-time student is one who is registered for at least 10 credits in the first two semesters of the program. It is recommended that students work no more than 16 hours per week at a job not related to their graduate program to guarantee maintenance of their full-time status.

A part-time student is one who is registered for fewer than 10 credits in the first two semesters of their program.

A thesis-only student is one who has completed the minimum period of full-time study in the M.Sc. Program and is still completing other requirements. If the work is being completed on campus, the category is "full-time thesis only"; if off campus it is "part-time thesis only."

A qualifying student is one who is required to do a minimum of one semester of preliminary work in order to meet admission standards before acceptance into a M.Sc. (Regular) Program.

Special students are those not accepted into a M.Sc. (Regular) Program but permitted by the Graduate Coordinator to take graduate courses.

SUPERVISOR AND SUPERVISORY COMMITTEE:**Supervisor**

At the time of application for admission to candidacy, the student must select a Supervisor. The Supervisor is the person who will be most directly involved in overseeing the student's research. The supervisor must obtain approval from their Department Head for each M.Sc. student he/she intends to supervise.

Each supervisor consents to:

- (i) guide and assist their graduate students;
- (ii) serve on examining committees for ATC and thesis defences;
- (iii) teach in a graduate module course or graduate course;
- (iv) contribute information to the annual reports of the Graduate Program.

A Supervisory Committee

A Supervisory Committee is recruited by the supervisor in consultation with the student. This committee is responsible for guiding the graduate student through the program. It consists of the Supervisor and other persons with expertise or interests relevant to the student's field of study. Its composition must be reported to the Graduate

Coordinator when the student applies for admission to candidacy.

The Supervisory Committee consists of the supervisor and at least two others. Supervisory Committee members may be chosen from outside NSAC; however:

- (i) where the Supervisor is not on the full-time staff of NSAC, a "Co-Supervisor" from NSAC must be appointed. This person is responsible to the College for the student's progress;
- (ii) the majority of committee members must be full-time faculty of NSAC. Supervisory Committees must meet with continuing students not later than mid-October, each year, to consider the student's Progress Report.

Supervisors should encourage students to consult other members of their Supervisory Committee, either individually or as a group, whenever it would be useful. Students have the right to call a committee meeting at any time. The committee should also have opportunities to critique the work in progress and make alternative suggestions before it appears in thesis form. Supervisors are therefore encouraged to call the committee together to discuss research progress more often than the statutory once a year described above.

THESIS REGULATIONS:**Preparation of Thesis**

An acceptable thesis will describe in clear and concise language an original contribution to knowledge of sufficient value to merit publication. The thesis must be written by the student but advice and constructive criticism from members of the Supervisory Committee should be sought during its preparation. It must be prepared according to instructions published by the Faculty of Graduate Studies of Dalhousie University and conform to Dalhousie University requirements for thesis. Detailed instructions may be obtained from the Research & Graduate Studies Office (Cumming Hall, NSAC). These regulations give details on:

1. Manuscript Originality
2. Preparation of Manuscript
3. Order of Contents
4. Submission Deadlines
5. Mailing Costs

Submission of Thesis for Examination

Copies of an M.Sc. Thesis for each member of the examining committee must be submitted to the Graduate Coordinator before the date of the

defence is made final. The thesis must be complete and suitable for printing, if accepted. The intent to defend must be communicated to the Graduate Coordinator six weeks prior to the desired defence date. This information is to be communicated in writing by the graduate student's supervisor along with the names of two or three potential External Examiners. The defence date is set for a minimum of three weeks following the receipt of the thesis at the Research & Graduate Studies Office. (See Thesis Defence Guidelines Document available at the Research & Graduate Studies Office)

Thesis Defence

The Thesis Examining Committee is usually the Supervisory Committee, an External Examiner and the Department Head, who chairs the examination. The External Examiner is recommended by the student's Supervisor. In selecting the External Examiner the Supervisory Committee should follow a priority of : a) qualified scholars outside of NSAC, b) Honorary Research Associates and Adjunct Professors of the NSAC, c) NSAC Faculty from a Department other than that with which the student is most closely associated, d) NSAC Faculty from the Department with which the student is most closely associated, but not on the student's Supervisory Committee. The External Examiner does not necessarily attend the defence but may instead submit a written report before hand.

Examination Formats

The thesis shall be defended orally before the Thesis Examining Committee and any other interested persons who choose to attend. A public announcement of the examination shall normally be posted at least two weeks before the event. A defense consists of a 10-20 minute survey by the candidate of the scope of the problem and main achievements. This is followed by presentation of the External Examiner's report and the student's response. After the members of the Thesis Examining Committee and the audience have questioned the candidate, the Thesis Examining Committee deliberates in camera, basing the decision both on the quality of the thesis and the candidate's ability to defend it.

Examination Results

The outcome is decided by the majority opinion of members of the Thesis Examining Committee present. Theses are graded on a pass or fail basis. The categories are: a) accepted as submitted; b) accepted on condition that minor revisions are made (the Supervisor is usually asked to monitor the required changes and a time limit is set by the

Thesis Examining Committee); c) accepted with major revisions - retesting is required (When resubmitted, the thesis will be re-read by an examining committee, containing at least two members from the original Thesis Examining Committee. The thesis shall be sent to an external examiner who may be the original External Examiner if the Chair of the examination considers this desirable. The revised thesis shall be defended in the usual way.); d) rejected. In the case of a failure the candidate or Supervisor may appeal this decision to the Chair of the examination in writing. If the Chair deems the evidence to be sufficiently strong, the Chair of the examination shall initiate the procedure for a re-examination. No more than one appeal may be entertained and the examination Chair's decision shall be final.

Deadlines for Submission of Theses

Deadlines for thesis submission:

August 17, 1998

The last day for those expecting to receive Masters degrees in October to submit *unapproved* theses to the Graduate Coordinator, Research & Graduate Studies Office, NSAC .

September 14, 1998

Last day for those expecting to receive Masters degrees in October to submit *approved* unbound copies of theses to Faculty of Graduate Studies, Dalhousie University.

December 18, 1998

Last day to submit *approved* theses to the Faculty of Graduate Studies, Dalhousie University for those registered in the fall term only.

March 12, 1999

Last day for those expecting to receive Masters degrees in May to submit *unapproved* theses to the Graduate Coordinator, Research & Graduate Studies Office, NSAC.

April 13, 1999

Last day for those expecting to receive Masters degrees in May to submit *approved* unbound copies of theses to Faculty of Graduate Studies, Dalhousie University.

Students are responsible for presenting to the Faculty of Graduate Studies, Dalhousie University one copy of the corrected and approved thesis for a formal check at least one week before the deadline date for submission of approved thesis to Faculty of Graduate Studies. Following a format approval,

students are responsible for presenting to the Faculty of Graduate Studies five (5) unbound copies (original and four copies) of the corrected and approved thesis. Only good quality photocopies or printed copies will be accepted.

Binding and Distribution

At the time of submitting approved unbound thesis (original and four copies) to the Dalhousie Faculty of Graduate Studies, students will present a cheque for \$85.00 payable to the Faculty of Graduate Studies, Dalhousie University. An additional charge will be made (where appropriate) to cover mailing costs. The Dalhousie Faculty of Graduate Studies will arrange for the binding of five copies of the thesis and its subsequent distribution as follows:

- (i) one copy to the author;
- (ii) one copy to the student's department;
- (iii) one copy to the student's Supervisor;
- (iv) two copies to the Library which retains one copy in the Agricola Collection.

Students pay for these services at the time they pass their thesis to the Faculty of Graduate Studies.

CONVOCATION

Graduate students have the option of attending convocation ceremonies at either the NSAC or Dalhousie University. Convocation ceremonies are held at the NSAC in May and at Dalhousie University in May and October. Students must fulfill all requirements including the payment of all fees prior to graduation. Applications to graduate are available at the Research & Graduate Studies Office and must be submitted to the Graduate Coordinator by July 2 to graduate in October and by December 1 to graduate the following May.

GRADUATE COURSES

Graduate Courses are intended only for students registered in the M.Sc. program and may be taken by undergraduate students only under exceptional circumstances.

REQUIRED REGULAR COURSES

These courses are restricted to graduate students.

AG570: Communication Skills & Graduate Seminar
AG571: Module Course
AG900: Graduate Thesis

RECOMMENDED REGULAR COURSES

Where an undergraduate student wishes to take one of these graduate courses, the following signatures are required for approval: the instructor(s), the relevant Department Head(s), and the Graduate Coordinator.

AG572: Applied Statistics & Experimental Design for Agriculture

OTHER REGULAR COURSES

Where an undergraduate student wishes to take one of these graduate courses, the following signatures are required for approval: the instructor(s), the relevant Department Head(s), and the Graduate Coordinator.

AG527: Economic Entomology
AG535: Animal Research Methods
AG536: Protein Nutrition
AG538: Quantitative Genetics
AG539: Molecular Genetic Analysis of Populations
AG552: Plant Breeding Methods
AG553: Nitrogen in Crop Production
AG556: Advanced Crop Physiology
AG573: Module Course II

SPECIAL TOPICS COURSES

Special Topics Courses may be taken by undergraduate students only under exceptional circumstances. The following signatures are required for approval: the instructor(s), the relevant Department Head(s), and the Graduate Coordinator

AG521: Special Topics in Environmental Microbiology
AG522: Special Topics in Weed Science
AG524: Special Topics in Environmental Impact

AG526: Special Topics in Plant Pathology
AG531: Special Topics in Applied Ethology
AG532: Special Topics in Animal Nutrition
AG534: Special Topics in Animal Physiology
AG537: Special Topics in Animal Breeding and Genetics
AG541: Special Topics in Soil Fertility
AG543: Special Topics in Environmental Analysis
AG546: Special Topics in Soil and Water Management
AG547: Special Topics in Analytical Instrumentation for Researchers
AG551: Special Topics in Plant Breeding
AG554: Special Topics in Crop Physiology
AG557: Special Topics in Agricultural Biotechnology
AG561: Special Topics in Animal Product Technology

CROSS-REFERENCED COURSES

Cross references with undergraduate courses are shown in brackets ().

AG525: Soil Microbiology (B400)
AG544: Organic Environmental Analysis (CS420)
AG545: Environmental Soil Chemistry (CS440)
AG558: Plant Biotechnology (PS475)
AG559: Biotechnology in Agriculture - Opportunities, Issues and Choices (IN475)
AG562: Ruminant Digestive Physiology & Metabolism (AS475)

GRADUATE COURSE DESCRIPTIONS

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, physio-logical and biochemical behaviour of herbicides in plants, environmental fate of herbicides, mycoherbicides, 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.

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.

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.

AG527: Economic Entomology

Instructor: **Prof. Le Blanc**

Insect pest management in agriculture with emphasis on a selection of non-chemical approaches to insect control, e.g. natural, mechanical, physical, cultural, biological, biochemical, and/or legal control. According to student(s) interest, a section on chemical control can be included. This course is consistently in accord with the theory and principles of integrated pest management (IPM) and consequently, the term assignments will incorporate the study of sampling techniques and monitoring methods of insect pests and related beneficial arthropods. Attendance to certain relevant seminars may be required and directed readings may be assigned.

A case history of a major agricultural insect pest will be included to satisfy the course requirement. The material will be submitted in term paper format and also delivered in an oral presentation. The case history will include the life cycle, host plants, pest status, damage, losses, control measures, research needs and IPM programs pertinent to the particular species.

Winter semester - 2 lecs and 1 tutorial per week.

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: **Prof. MacLaren**

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.

AG535: Animal Research Methods

Instructors: **Animal Science Faculty**

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. Next offered in 1998-99.

AG537: Special Topics in Animal Breeding and Genetics

Instructor: **TBA**

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.

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. Various DNA fingerprinting techniques, such as minisatellites, microsatellites, RAPD-PCR, FRLP-PCR and SSCP-PCR, and their applications in population genetic studies will be discussed. Students will acquire hands-on experience with some of these techniques. Analysis of molecular data to estimate intrapopulation populations (heterozygosity, Hardy-Weinberg equilibrium) and interpopulation parameters (test of heterogeneity of allele frequency distributions, genetic distances, phylogenetic analysis, bootstrapping, F-statistics) will be covered.

Fall 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.

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. Next offered in 1998-99.

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. Next offered in 1998-99.

AG546: Special Topics in Soil and Water Management

Instructors: **Profs. Havard, Madani, Gordon**

This course will discuss the state-of-the-art soil and water management practices in either humid or arid regions, depending on the specific needs of the graduate students. Topics may include: fundamentals of soil and water properties; drainage and water table control; management of farm irrigation and draining systems; salinity control; irrigation water requirements; drainage requirements for humid and arid regions; soil conservation; and computer modelling or irrigation and drainage systems. Guest speakers will be invited to share their experiences with the students.

Fall or winter semester - To be arranged with the Instructor.

AG547: Special Topics in Analytical Instrumentation for Researchers

Instructors: **Profs. Crowe and Stratton**

This course will be designed to meet the needs of graduate students who are using analytical instruments in their research. The course will provide the graduate student with specific theoretical knowledge and the necessary practical skills required to properly use the instruments of interest. The student will select either one of the following areas for detailed consideration, two to three of the following areas for a more general coverage: gas chromatography, liquid chromatography, atomic analysis, DNA or protein electrophoresis, infrared or fluorometric analysis, NMR, and mass spectrophotometry, microscopy.

Fall and Winter semesters - 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.

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. Next offered in 1998-99.

AG554: Special Topics in Crop Physiology (A)

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. Next offered in 1999-2000.

AG556: Advanced Crop Physiology

Instructor: **Prof. Caldwell**

Physiological processes relevant to crop plant development and production of harvestable yield will be examined.

Fall or Winter semester - To be arranged with the Instructor. Offered in alternate years. Next offered in 1999-2000.

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.

AG558: Plant Biotechnology *cross referenced as PS475.*

Instructor: **Prof. Nowak**

This course has limited enrolment.

Theoretical bases of plant tissue culture, overview of the organization and operation of a tissue culture laboratory and tissue culture techniques and their application to nuclear seed potato production, multiplication of horticultural crops and landscape plant material, production of secondary metabolites, germplasm development and plant breeding and conservation of genetic resources. Outline of the techniques of manipulation of plant genome will also be a part of this course. Students must complete an assigned project.

Winter semester - 2 lecs and 4 labs per week. Offered in alternate years. Next offered in 1998-99.

AG559: Biotechnology in Agriculture - Opportunites, Issues and Choices *cross referenced as IN475*

Instructor: **Prof. Nowak**

Overview of current developments in the application of biotechnology techniques to agriculture and related fields and their impact or potential impact on plant and animal production, food and feed quality, and bioresource and waste management will be the main focus of this course. Seminars and class discussions will address socio-economic, environmental and ethical considerations. Each student will give three seminars and write an essay on an assigned topic for the submission for publication in Farm Focus.

Winter semester - 2 lecs and 3 seminars per week.

Offered in alternate years. Next offered in 1999-2000.

Text - Baumgardt and Marshall, *Agricultural Biotechnology, Issues and Choices*.

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.

AG562: Ruminant Digestive Physiology & Metabolism *cross-referenced as AS475*

Instructors: **Profs. Fredeen and Lirette**

Prerequisites: 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. Next offered in 1998-99.

.AG570: Communication Skills & Graduate Seminar

Instructors: **Profs. Stratton and Burnside**

Through practical assignment students will be able to test and develop their communication skills.

Topics will include review, criticism and writing of 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 I

Coordinator: **Prof. Caldwell**

This course normally consists of three modules. Each module consists of one month of lectures or assignments 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. Students should not apply to take a module unless they have at least a second year undergraduate background in the focus area. A formal evaluation is made at the end of each module. All graduate students are required to complete this course, and are encouraged to do so

in their first year of study.

Fall and winter semester - 2 or 3 lecs per week.

AG572: Applied Statistics & Experimental Design for Agriculture

Instructor: **Prof. Astatkie**

Prerequisite: MP420, or equivalent.

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 and a project involving real experimental problems and data sets. Students will also be expected to acquire proficiency in at least one advanced statistical software package.

Winter semester - 3 lecs per week.

AG573: Module Course II

Instructors: **TBA**

Prerequisite: AG571

This course normally consists of three modules. Each module consists of one month of lectures or assignments 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. Students should not apply to take module unless they have at least a second year undergraduate background in the focus area. A formal evaluation is made at the end of each module.

AG900: Graduate Thesis

Students register for this course when they are engaged in research work for credit towards the M.Sc. in Agriculture degree.

Fall and winter for program duration.

SCHOLARSHIP SECTION

Specific inquiries regarding scholarships and bursaries should be directed to the college's Awards Office located in Room 106, Cox Institute, by phone at (902) 893-6729, by fax (902) 895-4547, or by E-mail at b.crouse@nsac.ns.ca. The college's Scholarship Committee reserves the right to authorize changes at any time to the selection criteria and awarding of scholarships, bursaries, and prizes.

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 students with the highest academic standing in each of the following programs, Degree and Technical.

Scholarship

A scholarship is an award to a student based primarily on academic performance, although other criteria may be considered based on the donors' requirements.

Bursary

A bursary is a monetary award to a student where the primary criteria is not academic performance.

Prize/Gift

A prize or gift is an award given to a student based on the selection of the donor.

Note: In the descriptions of the various scholarships, bursaries, and prizes that follow where the selection criteria is not specified, the guidelines above apply.

ENTRANCE SCHOLARSHIPS AND BURSARIES

The following scholarships and bursaries are available to students entering study at the Nova Scotia Agricultural College.

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 N.S.
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 enrollment. 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 July 31 at the following address:

Kings County Federation of Agriculture
Blair House
Agricultural Centre
Kentville, NS B4N 1J5

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 the NSAC. Selection criteria include academic performance and financial need. No application is required.

Newfoundland Provincial Scholarships

The Newfoundland government, through its Department of Education, awards three scholarships of \$1000 each to Newfoundland students entering 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 Newfoundland students entering studies at NSAC (one technical and one degree). Selection will be based on academic performance. No application is required.

NSAC Entrance Scholarships

Up to five renewable scholarships will be awarded annually by NSAC to students entering a full-time program of study either directly from high school or with no advanced standing from other post-secondary study. *NSAC Entrance Scholarships* will provide tuition (for the respective program of study) and residence costs (at shared room rate, for as long as the recipient chooses to live in residence). In order to qualify for the value of the shared room portion of room and board fees, the recipient must reside in residence for the full academic year, each year the scholarship is held. Students entering either technical or degree programs at the college are eligible. Only those applicants who have achieved a minimum average of 85.0% on the courses required for admission shall be considered. Selection criteria include academic performance (on courses required for admission), geographic distribution (in most years at least one scholarship will be awarded to a student from each of the Atlantic Provinces), extra curricular activity, and a recommendation from an official representative (e.g. Guidance Counsellor) of the high school or other previously attended post secondary educational institution. The *NSAC Entrance Scholarships* are tenable for the normal duration of the program of study admitted to. These scholarships are renewed by maintaining an annual average of 80.0%. See NS Dept. of Agriculture and Marketing Scholarship for additional renewal criteria. Applications must be submitted to the NSAC Awards Office not later than March 1.

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 Department of Agriculture and Marketing Entrance Scholarship Program

As an entrance scholarship, the scholarships are available to Nova Scotia students entering post-

secondary study for the first time at NSAC or Nova Scotia students entering programs with no advanced standing (carrying no credits from other post-secondary institutions). NSDAM Scholarships are also awarded to Nova Scotia students entering study at NSAC with post secondary record - students high school marks must still have met the eligibility requirements and must have maintained first class standing (80% average) in post secondary study.

- \$2000 renewable scholarships are awarded to the top three Nova Scotia students entering degree programs (based on averages of the five subjects required for admission to the respective program of study)
- \$1500 renewable scholarships awarded to all other Nova Scotia students entering degree programs with 85.0% averages in five required courses for admission to the respective program of study.
- \$1500 renewable scholarships will be awarded to the top three Nova Scotia students entering technical programs - technician and technology (based on the averages of subjects required for admission to the respective program of study).
- \$1000 renewable scholarships awarded to all other Nova Scotia students entering technical programs - technician and technology with 80.0% averages in the subjects required for admission for the respective program of study.

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

Nova Scotia Power Inc. University Scholarship

The Nova Scotia Power Inc. \$1500 university entrance scholarship is awarded to a Nova Scotia student entering on a full time basis the first year of an undergraduate degree program at NSAC. The scholarship is tenable for up to four years (renewed by maintaining an 80.0% average in the previous year). Selection criteria include academic performance and demonstrated involvement in

extra-curricular activities. Applications must be submitted to the NSAC Awards Office not later than September 20.

Prince Edward Island Institute of Agrologists Scholarship

The \$500 PEIIA Scholarship is awarded to a PEI student entering the B.Sc.(Agr.) program. Selection criteria includes 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, PEI, two \$1000 scholarships and one \$500 scholarship are awarded to first year PEI students. Selection criteria include academic performance, financial need, future plans and career ambitions, and participation in sports, school, and community activities. Application forms are available from PEI high school Guidance Counsellors or the NSAC Awards Office 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.

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.

Athletic Bursaries

Two \$100 awards (one to a male and one to a female student) will be presented to returning students at NSAC. Selection criteria include financial need, involvement in/member of college varsity team, recommendation from a coach and satisfactory 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 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 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 \$500 bursary to a student from the Atlantic

Provinces who is enrolled in subjects that reflect an interest in poultry. A letter of application must be received by September 20 at the following address:

Alex Oderkirk
 APHF Secretary
 c/o NSDAM
 P. O. Box 550
 Truro, NS B2N 5E3

A.B. Banks Memorial Scholarship

The \$500 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 who enters the second year of the Animal Science option. No application is required.

Beaver Foods Limited Scholarships

Beaver Foods Limited awards \$2000 in scholarships to outstanding students with high academic performance who, for one reason or another, have not qualified for other significant awards. Preference will be given to students living in residence. 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 interest and experience in small fruits. 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 \$700 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.

Canadian Institute of Forestry (Nova Scotia Section) Bursary

The Nova Scotia Section of the Canadian Institute of Forestry awards a \$250 bursary to a Nova Scotia student enrolled full time at NSAC with an interest in Forestry, Woodlot Management or Arboriculture. Selection criteria include financial need, interest in and aptitude for Arboriculture/Forestry, and academic performance. 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
 N.S.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 scholarship is awarded to a student 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 is tenable for two years. Applications must be submitted to the NSAC Awards Office not later than September 20.

Dorothy Creelman Cox Scholarship

A 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.

Dartmouth Horticultural Society Bursary

The \$500 Dartmouth Horticultural Society Bursary is awarded to a student in their final year of studies at NSAC. Selection criteria include financial need, interest and experience in the agri-food industry and academic performance. Although students in all programs are eligible preference will be given to a student in a Plant Science (horticulture) program. Applications must be submitted to the NSAC Awards Office by 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.

Ernest L. Eaton Memorial Scholarships

Two scholarships, one for a male and one for a female, are awarded to non Nova Scotian 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. No application is required.

Chuck Harrison Memorial Bursary

In memory of Chuck Harrison, Class of 1970, a \$200 bursary is awarded to a final year Agricultural Business Technician student. Selection criteria include leadership and involvement in athletic and other activities at NSAC and a sound academic record. No application is required.

Isgonish Chapter Silver Anniversary IODE Bursary

The \$400 Isgonish Chapter Silver Anniversary IODE bursary is awarded to a student entering the 3rd year of the B.Sc.(Agr.) program in the Aquaculture major. Selection criteria include financial need, academic performance, and participation and leadership in extra curricular activities. The bursary is renewable by maintaining a 80% average. One award will be presented annually either to a third year student or a fourth year student as a renewal to the previous year's recipient. 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 July 31 at the following address:

Kings County Federation of Agriculture
Blair House, Kentville Agricultural Centre
Kentville, NS B4N 1J5

Lunenburg/Queens Federation of Agriculture Scholarship

The Lunenburg/Queens 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 includes 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 includes academic performance, financial need, and participation in 4-H Club activities. 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.

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.

Maritime Provinces Swine Producers' Bursaries

The New Brunswick and PEI Hog Marketing Boards, and Pork Nova Scotia jointly sponsor two \$500 prizes to students with an interest and/or background in swine production (one to a degree student and one to a technical student). Selection criteria include demonstrated interest in the swine industry (through course or project work), academic performance and financial need. Applications should 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 \$250 scholarship is awarded to a student in horticulture. No application is required.

McRorie Scholarship

In memory of Douglas McRorie, P.Ag., FAIC, a past President of AIC and Vice-President (Agricultural Services) of the Royal Bank of Canada, two \$500 scholarships are awarded to students who are entering the third or fourth 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 extra curricular activities. Applications must be submitted to the NSAC Awards Office not later than September 20.

John Miller Memorial Bursary

The \$1000 John Miller Memorial Bursary is awarded to a Nova Scotia student in any year of any program whose course and project work and career plans reflect an interest in the hog industry or whose application shows interest, understanding and appreciation for Nova Scotia's hog industry. The bursary is in memory of John Miller who served as Secretary/Manager or Pork Nova Scotia from 1983-1997. Deadline date to apply is September 20.

A.C. Neish Memorial Trust Scholarship

The A.C. Neish Memorial Trust awards a \$1600 scholarship to an NSAC student entering the final year of the B.Sc.(Agr.) program. Selection criteria includes 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 Entrance Scholarships

Renewal Criteria

1. NSDA&M Entrance Scholarships are renewed at their initial value by maintaining an average of

80.0% or greater each year. Scholarships are renewed on a continuous basis - renewed annually with 80% average in work of previous year.

2. The two semesters used to evaluate academic standing must be consecutive and follow the academic year (eg. fall semester and the winter semester).
3. Eligible students must be registered for a minimum of eight courses over two semesters with no semester with less than three courses.
4. Averages are calculated to one decimal place. There is no rounding up of averages. The average is determined by all marks earned by the student in the previous year — non-credit courses (MP075, MP085 and MP090) are included in the calculation of the year's average for degree students.
5. The scholarship is granted in two installments. The recipient receives half of the award for the fall semester and the winter portion (1/2 of scholarship) in January provided the student is meeting the requirements of criterium 3.

Nova Scotia Department of Agriculture and Marketing Scholarship Program For In-Program Students

At the discretion of the Scholarship Committee, scholarships of variable amounts will be awarded to Nova Scotia students who perform well in their studies at NSAC. Students considered for these awards will be those who had not been eligible to receive the NSDA&M Entrance Scholarship on admission or those who had forfeited their NSDA&M Entrance Scholarship any year. Minimum requirement will be 80.0% average in work of previous year (eight courses or more required in the year and with no more than one DF in record to date) with preference to students who have, in addition, maintained a cumulative average of 80.0%.

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 are considered in making the award. No application is required.

Nova Scotia Federation of Agriculture 100th Anniversary Scholarships

In recognition of the 100th Anniversary of the Nova Scotia Federation of Agriculture in 1995, scholarships are awarded to Nova Scotia students with farm backgrounds studying in any year of any

program at NSAC who have not qualified for other significant awards. Applications must be submitted to the NSAC Awards Office not later than Sept. 20.

Nova Scotia Milk Producers Bursary

The Nova Scotia Milk Producers Association awards a \$1000 bursary to a Nova Scotia student doing project or course work related to the dairy industry. Students in the third or fourth year of the B.Sc.(Agr.) program (any option) or graduate students undertaking course or project work related to the dairy industry are eligible. Selection criteria include proven interest and experience in the dairy industry, the potential beneficial impact of study on the Nova Scotia dairy industry 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.

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.

Robert Parent Memorial Scholarship

In memory of Robert Parent, Class of 1921, this scholarship will be awarded to an outstanding student studying in any year of any program who have not qualified for other significant awards. No application is required.

Cliff Retson Memorial Bursary

In memory of Cliff Retson, Class of '34 a \$500 bursary is awarded to International students studying at NSAC. Students in any year of program are eligible. Selection criteria include financial need, academic performance, and interest in and involvement in multi-cultural activities on campus. Applications must be submitted to the NSAC Awards Office not later than September 20.

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.

J. Arnold Roberts Memorial Scholarship

In memory of J. Arnold Roberts a \$1000 scholarship will be awarded to an outstanding student from Atlantic Canada studying in any year of any program not receiving scholarships of greater value. 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.

Rhonda Rae Rumbolt Memorial Scholarship

In memory of Rhonda Rae Rumbolt, a \$2000 scholarship is awarded to a final year B.Sc.(Agr.) student. Selection criteria include leadership and involvement in the college community as displayed by participation in extracurricular activities and high academic performance. 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 final year B.Sc.(Agr.) student in the Animal Science option. Selection criteria include academic performance, leadership qualities, and participation in student & community affairs. Applications must be submitted to the NSAC Awards Office not later than September 20.

G.G. Smeltzer Bursary

The \$300 G.G. Smeltzer Bursary is awarded to a second year student who excelled in the work of the first year Plant Science technician program. Preference will be given to students whose course and project work reflect an interest in Agronomy. No application is required.

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 \$500 scholarship is awarded to a final year B.Sc.(Agr.) student. No application is required.

Florence (Pineo) Ward Memorial Award

Three to five bursaries will be awarded annually in memory of Florence (Pineo) Ward to NSAC students in financial need. Recipients will have completed at least one year of study in a technical or B.Sc.(Agr.) program. Preference will be given to students with sound academic background who have come to NSAC for technical training to enhance their employability but financial constraints are limiting their ability to continue their studies. In the event two or more candidates otherwise qualify for one of the awards, preference will be given to students from Boutlier's Point, Halifax County, or Advocate, Cumberland County. Letters of application must be submitted to the NSAC Awards Office not later than Sept. 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.

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.

Nova Scotia Agricultural College

P.O. Box 550

Truro, Nova Scotia B2N 5E3

MEDALS & PRIZES

Canadian Agricultural Economics and Farm Management Society Prize

The Canadian Agricultural Economics and Farm Management Society presents a book prize at Autumn Assembly to a graduating student from the Agricultural Economics option of the B.Sc. (Agr.) program. This award is selected on the basis of overall performance. The recipient is selected by the Department of Agricultural Economics and Business Management.

Canadian Society of Animal Science Prize

The Canadian Society of Animal Science presents a book prize at Autumn Assembly to a student in the fourth year of the Animal Science option of the B.Sc.(Agr.) program. This award is selected on the basis of outstanding scholarship.

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.

Noel Enman Memorial Award

Established in 1984, the Noel Enman Memorial Award is presented annually in memory of NSAC alumnus, Noel Enman, 1961-1983, to a technician or technology graduate whose personality and fellowship have contributed to student life and activities, there by gaining the respect of the students and faculty at NSAC. Nominations should be submitted through the office of the Dean of Student Services by February 15. The award is presented at the graduation class banquet prior to Convocation.

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.

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.

R.H. Stevenson Memorial Prize for Mathematics and Physics

In memory of the late Professor R.H. Stevenson, a \$100 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 AT NSAC

Stuart F. Allaby Graduate Studies Fund

Stuart F. Allaby Graduate Studies Fund will provide an annual prize to a M.Sc. student at NSAC concentrating on animal research.

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

Dr. Patricia Harney, NSAC Diploma Class of 1948 and OAC Professor in Horticultural Sciences has, through her estate, made generous provision to support NSAC students who wish to pursue graduate studies in agriculture at Macdonald College, McGill University or at the University of Guelph. These scholarships are to be granted to students based on high academic records who are committed to research excellence.

Two \$5000 renewable scholarships from this fund serve to preserve the long-standing links between NSAC, Macdonald College and Guelph. These awards are tenable for two years for a Masters Degree program and three years for a Ph.D. program. Renewability will be based on maintaining scholarship standing in the program (will require A- or 80%).

To be eligible, NSAC graduates must be accepted or registered at Macdonald College or the University of Guelph for graduate work in agriculture. Recipients, while registered at the University of Guelph or Macdonald College may, with appropriate permission, pursue research at NSAC. Scholarship funds will be disbursed to the recipient through the institution in which the student is registered.

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.

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, NS B2N 5E3

Nova Scotia Power Inc. Centennial Scholarships in Engineering

In 1967 Nova Scotia Power instituted four permanent scholarships as a continuing Centennial project. These scholarships are tenable only at DalTech, and are open to students completing engineering studies at the following associated

universities: Acadia, Dalhousie, Mount Allison, St. Francis Xavier, Saint Mary's, the University College of Cape Breton, and the Nova Scotia Agricultural College.

The scholarships are for a term of two years at \$1500 per year and are applicable to Electrical, Mechanical, Chemical, Civil and Industrial disciplines. Applicants must be Canadian citizens and residents of Nova Scotia for at least three years, two years of which are immediately prior to graduation. A selection board considers the academic excellence, personality and involvement in extra-curricular activities of applicants recommended by the Ag. Engineering Department at NSAC. Continuance of the scholarships will be conditional on the attainment of a satisfactory academic record. Application deadline is April 30.

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

(for which NSAC students are eligible to apply)

OTHER ENTRANCE SCHOLARSHIPS

(Although not exclusive to NSAC students, the following scholarships/awards are available to students entering NSAC.)

The Co-Operators 4-H Scholarship

The Co-Operators award ten \$1000 entrance scholarships to students entering post-secondary study. To be eligible applicants must have been 4-H members within the last 5 years and an active member for at least 2 years. Selection criteria include: personal background, goals and ambitions, and community involvement. An essay of 500 - 1000 words, or a video, speech or poster with a theme of farm safety focussing on accident prevention is required. Application details from Provincial 4-H Office.

Co-op Atlantic McEwen Scholarship

Two university entrance awards of \$1000 are open to employees and dependents of members of Co-op Atlantic. This is a four year renewable scholarship. Selection criteria include academic performance, demonstrated leadership ability and interest in co-operation and co-operatives. Deadline: May 31.

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 April 1 to:

E.B.I. Inc., Atlantic Branch
Box 1567
Fredericton, New Brunswick E3B 5G2

New Brunswick Fruit Grower's Association Scholarship

The \$300 New Brunswick Fruit Grower's Association Scholarship is awarded to a New Brunswick resident entering a program of study in horticulture or related courses at an agricultural college or university with the purpose of returning to, or working in, the New Brunswick tree fruit industry. Selection criteria include: academic performance, involvement in community activities, volunteer work, farming or orchard experience, interests in the fruit-growing industry and future career plans. Applications must be submitted not later than September 30 to Scholarship Committee, NBFGA, 1115 Regent Street, Suite 206, Fredericton, New Brunswick E3B 3Z2

Prince Edward Island 4-H Council Scholarship

The P.E.I. 4-H Council awards a \$1000 scholarship to a student with a P.E.I. 4-H background entering post-secondary study. Selection criteria include: knowledge of 4-H history, community involvement, goals and ambitions, an essay and an interview. Deadline: early April.

P.E.I. Mutual Education Trust Fund Centennial Scholarship

Twenty \$450 entrance scholarships available to P.E.I. students that are attending any post-secondary institution. Selection criteria are based on academic performance and financial need. Deadline: May 31.

Robert Walker Memorial Scholarship

Established in 1975 as a memorial to Robert Walker who lost his life in a farm accident scholarships are awarded to students from New Brunswick entering a first year of post-secondary study. Applicants must have been an active 4-H member in the Southern District in New Brunswick with a farm background. Application details are available from the New Brunswick Department of Agriculture and Rural Development, Sussex, NB

Western District (NB) Grain Growers Scholarship

This \$300 scholarship is awarded to a student currently registered in the 4-H Program in the Western District of New Brunswick, entering post-secondary study in the fall. Selection criteria include: financial need, academic record and 4-H involvement. Application information from New Brunswick Provincial 4-H office.

OTHER CONTINUING SCHOLARSHIPS

(Although not exclusive to NSAC students, the following scholarships/awards are available to students studying at NSAC.)

Agriculture and Agri-Food Canada Scholarship Program

The objective of the program is to provide incentives to encourage more students to pursue graduate degrees in agriculture and agri-food related disciplines so as to promote the development of sufficient expertise in the agri-food sector. Agriculture and Agri-Food Canada is proactively meeting future needs for new scientists, engineers, economists and other professionals in the increasingly technical agri-food sector. Graduate studies which offer programs in the following areas: agri-food marketing and trade; agri-biotechnology; environmentally sustainable agricultural production systems; food technology; industrial uses of agricultural commodities; and information technology related to agriculture and agri-food. \$15,000 at the graduate level with a possibility to renew for one additional year and \$17,000 at the Doctoral level. Applications are by nomination only: University department heads may nominate candidates using the appropriate application forms. Nominations must be received by July 2.

Atlantic Golf Superintendents Association Scholarship

The Atlantic Golf Superintendents Association Scholarship is available to residents of Atlantic Canada. It's 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.

Dr. Kim Beck Memorial Scholarship

The Turkey Farmers of New Brunswick Marketing Board awards a \$500 scholarship in memory of Dr. Kim Beck. The scholarship fund will be awarded annually to a resident of the province of New Brunswick who is enrolled in a post secondary agricultural program. Selection will be based on the following criteria: academic achievement, financial need, involvement in agriculture, and interest in the poultry or food industry. Applications must be received by September 30.

Canadian Association of Diplomas in Agriculture Programs (CADAP) Bursaries

The Canadian Association of Diplomas in Agriculture Programs (CADAP) is an organization of post-secondary educational institutions offering diploma programs in agriculture. Its membership consists of institutions from across the country with a variety of programs emphasizing the agriculture of their region.

To enable students from member institutions to benefit from this diversity in programs, the geographical variation and the differing cultural backgrounds, CADAP will be offering, annually, bursaries for two students to participate in an exchange between member institutions. Duration of the exchanges will be either one of two semesters or practical experience work sessions of at least 12 weeks. Applications must be submitted not later than December 15 to:

Vice Principal, Academic and Research
Nova Scotia Agricultural College
P.O. Box 550, Truro, NS 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, ON 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, NB E0E 1P0

Farm Credit Corporation 4-H Scholarship

Farm Credit Corporation awards \$1000 scholarships to students from each province who had been registered 4-H members in the last five years who are in any year of any program of post-secondary study. Selection criteria include: interest and knowledge of Canadian Agricultural issues, personal background, goals and ambitions, community involvement, an essay and an interview. Contact the Provincial 4-H Office for application details.

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.

Hants County Exhibition Scholarship

This \$1000 scholarship is sponsored by the Windsor Agricultural Society. Applicants must be residents of Hants County, NS, entering any year of any program at a recognized agricultural or veterinary college and have aspirations of working in the agricultural industry. Selection criteria include academic performance, extra-curricular activities, part-time employment, and career plans. Copy of transcript and application form must be received by August 26 at:

Windsor Agricultural Society
Box 368
Windsor, NS B0N 2T0

Harvest Trust 4-H Scholarships

Harvest Trust awards ten \$500 scholarships to students (one/province) who had been 4-H members within the last five years and active in the 4-H program for at least two years who are pursuing a Degree in Agriculture. Selection criteria include: personal background, goals and ambitions, financial need, community involvement and interest and knowledge of agricultural issues. Applicants must submit an essay of 500-1000 words addressing one of the following topics:

- 1) We are living in a global economy. What can individual producers do to ensure Canadian products can compete in the competitive export markets?
- 2) How can producers become more pro-active in the marketing of agricultural products?
- 3) What action must producers and producer organizations take to ensure sustainable agriculture?
- 4) What effect does sustainable agriculture, animal welfare and environmental protection have on customer attitudes and consumer patterns?

For application deadline and details contact the Provincial 4-H office.

Anna Helvig Schousboe Scholarship

This \$300 scholarship is awarded to a resident from Kings County, NB working towards a degree or diploma in Agriculture, Veterinary Medicine, or Home Economics. Application deadline: August 31st. Application information from NB Department of Agriculture and Rural Development, Sussex, NB.

Holstein Association of Canada Scholarships

Holstein Canada awards two \$1000 university scholarships and two \$500 diploma 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 must be submitted not later than June 25 to:

Jane N. Whaley, Scholarship Committee, Holstein Association of Canada, P.O. Box 610, 171 Colborne Street, Brantford, ON 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, ON M9W 6C7

The Leonard Foundation

The Leonard Foundation is a private scholarship trust established in 1916 by the late Reuben Wells Leonard. The Foundation offers financial assistance to university students who are experiencing specific financial difficulties. Full-time students who are enrolled in an undergraduate or first professional degree program in a recognized Canadian college or university (AUCC) are eligible. All applicants will be considered but preference will be given to sons and daughters of clergy, teachers, military personnel, graduates of Royal Military College, members of the Engineering Institute of Canada and members of the Mining and Metallurgical Institute of Canada. The amount of assistance may vary depending on the applicant's financial situation, but in average, will be in the amount of \$1250. Applications must be submitted and an interview arranged with a Nominator nearest you (listed on insert in application) by March 15.

Applications are available from:

The Provincial Nominator
The Leonard Foundation
1774 Pryor St.
Halifax, NS B3H 4G8

Terry MacDonald Memorial Scholarship

This scholarship is awarded to a Southern District, NB 4-H member from a farm family entering or enrolled in post-secondary study. Application deadline: July 31st. An interview is part of the application process. Applications available from

Ron Menzies,
R.R. #4, Norton, N.B. EOG 2N0

C.C. MacDougall Scholarship

This \$250 scholarship is awarded to a student pursuing a degree or diploma in Agriculture, Home Economics or Veterinary Medicine. Eligible students must have been a 4-H member from Kings County, New Brunswick, or anyone whose parents raise or breed Guernseys anywhere in New Brunswick. For application information contact the NB Department of Agriculture and Rural Development, Sussex NB.

The Maritime Dairy Industry Scholarship

Two individual scholarships of \$2000 will be awarded. Students eligible to apply for this scholarship include any student currently attending a post-secondary education institution within Canada, completed at least three years of study in a program that has application to the dairy industry, and must be a resident of either Nova Scotia, New Brunswick or Prince Edward Island and must show professional and academic promise and a commitment and interest in the dairy industry.

Applicants must complete the application form, one-page letter stating their commitment and interest in the dairy industry, official transcript of marks for completed years in post-secondary education, and three reference letters (at least one from a professor). Selection criteria will be based on the following: application requirements, academic standing, potential contribution and commitment to the dairy industry. Applications must be submitted by December 30 to:

The Maritime Dairy Industry Scholarship Committee
c/o Milk Maritime Inc.
191 Halifax Street, Suite 3
Moncton, NB E1E 4E1

The Netherwood Foundation

The Netherwood Foundation offers four \$4000 scholarships to New Brunswick women entering second year post secondary education. Applications must be submitted not later than July 15 to: The Netherwood Foundation, c/o W.B. Budge, C.A., Rothesay, New Brunswick E2E 5A5.

New Brunswick Institute of Agrologists Scholarship

The New Brunswick Institute of Agrologists awards a \$1000 scholarship to a student from New Brunswick entering the third year of a degree course in Agriculture at a recognized Canadian Agricultural Education Institution. Selection criteria include: academic performance, participation in extra-curricular activities and financial need. Applications must be submitted not later than October 1 to:

Registrar
New Brunswick Institute of Agrologists
PO Box 3479, Station B
Fredericton, NB E3A 5H2

New Brunswick Milk Marketing Board Scholarship

The NB Milk Marketing Board awards a \$500 scholarship to a New Brunswick resident, enrolled in a technician or technology diploma or certification program related to agriculture and the dairy industry at a recognized agricultural or community college. Selection is based on financial need, academic achievement, participation in community activities and future plans. Application deadline: July 3rd.

George W. Slipp Memorial Scholarship

The Chicken Farmers of New Brunswick Marketing Board award a \$1000 Scholarship in memory of Mr. George W. Slipp. The scholarship fund will be awarded annually to a resident of the province of New Brunswick who is enrolled in a post secondary agricultural program. Selection will be based on the following criteria: academic achievement, financial need, involvement in agriculture, and interest in the poultry or food industry. Applications must be received by September 30.

Southern District 4-H Council Scholarship

The Southern District 4-H Club Council in New Brunswick awards a \$150 scholarship to a Southern District NB 4-H member attending a post-secondary institution. Application details from NB Provincial 4-H office.

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, NB E0E 1P0

GENERAL INFORMATION

The Centre for Continuing and Distance Education

The Centre for Continuing and Distance Education is the division of NSAC which offers flexibility in providing educational opportunities for people at times and places that are convenient to them. Continuing Education Programs are designed to assist adults to acquire the knowledge, skills and perspectives which will help enhance their personal and professional development. The Centre's programming is a co-operative effort involving many Departments and individuals from the NSAC, the Nova Scotia Department of Agriculture and Marketing, and other government and industry groups.

As part of our commitment to life-long learning, the Centre's programs are designed to assist adults acquire the knowledge, skills and perspectives which will help enhance their personal and professional development. Through both on-site delivery, and via a new comprehensive distance delivery system, the Centre for Continuing and Distance Education offers a wide range of programming both on campus and throughout Atlantic Canada. Our courses include professional upgrading courses, career skills programs, short courses in special agri-food topics, business and management training, accounting, Certificate programs; as well as our range of custom designed courses for particular client groups. Through daytime, evening, weekend, and distance delivery programming, the Centre for Continuing and Distance Education provides educational opportunities for people at times and places that are convenient to them.

In 1995-96, for example, the Centre for Continuing and Distance Education offered 134 courses and provided training for 1,469 individuals. New programming dealing with current issues is regularly developed.

The Centre's programming is a co-operative effort involving many departments and individuals from the NSAC, the Nova Scotia Department of Agriculture and Marketing, and other government and industry groups.

Computer Lab: The Centre has a Pentium equipped computer lab and offers professional training in the range of computer applications. Our computer training features hands-on learning and small class sizes. We are pleased to be able to offer professional computer training to staff of the Nova Scotia Department of Agriculture and Marketing, as well as a number of other provincial and federal divisions.

Summer School: As part of our service to the campus community, the Centre traditionally offers a Summer School where a number of credit courses are held during the spring-summer semester. Courses offered are based on student need.

Contact us for a free Calendar...

Space limitations prevent a complete listing of our offerings here, however, a comprehensive listing of our courses and Certificate programs may be obtained from the Centre's Continuing and Distance Education Calendar (see address at the end of this section) and current information and updates can be accessed at our WEB site:
<http://www.nsac.ns.ca/nsac/ce>

For your information however, main program areas are listed below:

- Custom Programming: training programs designed to meet client needs
- Management and Professional Development
- Computer Applications
- Accounting programs
- Livestock Agriculture programs
- Landscape and Horticulture programs
- Business Diversification
- Starting a Small Business

Starting a Farm Business
 Pesticide Training
 Meat Cutting
 Food Product Technology
 Agriculture and Ecosystems
 Professional Development for Agrologists
 Floral Design programs
 Home Gardening programs
 Farrier
 Horse Ownership and Care
 Machinery and Equipment
 Welding
 Pond Culture of Trout
 Christmas Tree Production
 Forestry and Wildlife Management
 Distance Education Design and Delivery

Distance Education: The Centre is actively developing a distance education capacity to offer distance learning opportunities through independent home-study packages and "teaching at a distance" programming throughout the region which brings an "electronic classroom" to your community.

You've always wanted to take one of our courses but...travelling to the NSAC is too costly; you can't afford the time away from your work; you have family commitments that keep you close to home.

If any of these issues are holding you back from pursuing further education... we may be able to help.

The Centre for Continuing and Distance Education is now able to offer many of its courses directly to your home community using an exciting, new, easy-to-use computer communications technology called Audiographics. With Audiographics you take part in class: listen to the professor, see the graphs and slides, ask questions, and have discussions with other students—all without leaving your own local community. No previous computer experience is necessary.

We can deliver programming to some 35 sites in Nova Scotia, 45 Sites in New Brunswick, and we are building our capacity to deliver to Newfoundland and PEI.

Nova Scotia Sites include: Advocate Harbour, Bridgewater, Dartmouth, Eskasoni, Halifax, Kentville, Mulgrave, Pictou, Shelburne, Sherbrooke, Stellarton, Windsor, Baddeck,

Canso, Digby, Guysborough, Inverness, Middleton, Parrsboro, Port Hawkesbury, Sheet Harbour, Springhill, Sydney.

New Brunswick Sites include: Baie Ste. Anne, Jacquet River, Bathurst, Blacks Harbour, Blackville, Bristol, Burnt Church, Campbellton, Caraquet, Centreville, Chatham, Dalhousie, Dieppe, Mulgrave, Saint Quentin, St. Stephen, Shippagan, Sussex, Grand Sault, Tracadie, Woodstock, Minto, Moncton, Neguac, Newcastle, Perth-Andover, Plaster Rock, Rexton, Rogersville, Sackville, St. Andrews, Saint John, Doaktown, Edmundston, Fredericton, Gagetown, Grand Falls, Grand Manan.

If you live in, or near, any of the above communities, we can bring many of our courses to your doorstep. Other communities may be added where demand warrants.

"Smart-Room" Video Conferencing Systems: In addition to our Audiographics system, the Centre also has three "Smart-Room" video conferencing systems which allow for completely interactive teaching and student participation at a distance. Our pilot network is being established with the cooperative support of NSAC, the Nova Scotia Department of Agriculture and Marketing and Agriculture and Agri-Food Canada, with stations at Kentville, Halifax and Truro. Links throughout Atlantic Canada are planned. In addition to allowing our programming to reach more people, these systems will also facilitate bringing in various expert speakers and guest lecturers from distant points "electronically", thereby offering an enriched educational experience for our students.

Many of our programs may be simultaneously offered in Kentville, Truro and Halifax, depending on student interest in these communities. Call us for more information.

Application Process: Application for any of our programs is made by completing and returning an Application Form available from the Centre. Details on tuition, course requirements, times and places are provided with each course description in the Centre's Calendar. Students should note that in addition to cash and cheques, the Centre now accepts MasterCard and VISA payments via fax.

For your Continuing and Distance Education Calendar, information on courses offered, tuition and scheduling, or to discuss custom training, please contact:

Centre for Continuing and Distance Education
Nova Scotia Agricultural College
P.O. Box 550, Truro, Nova Scotia B2N 5E3
Phone: 902-893-6666 Fax: 902-895-5528
email: conted@cox.nsac.ns.ca
WEB site: <http://www.nsac.ns.ca/nsac/ce>

Note: on campus, the Centre's main office is now located in Room 203 in the Animal Science building.

Churches

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

Day Care

The Nova Scotia Agricultural College Day Care is a non-profit organization governed by a Board of Advisors appointed by the Principal. The Day Care is open five days a week from 7:30 a.m. to 6:15 p.m. It is licensed under the Department of Community Services for 33 children per day. 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.

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, a B.Tech (Landscape Horticulture), four technician programs, seven technology programs, and numerous vocational and continuing education courses are offered.

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 two years in any engineering discipline at DalTech or may apply to any other institution.

Two-year programs leading to Technician Diplomas are offered in Agricultural Business, Bio-resources 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 Quality, 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 1998-99 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

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, career services and athletics.

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.

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.

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 Assistant Dean Health Services. It is strongly recommended all students obtain medical insurance which at minimum provides coverage for prescription drugs, physiotherapy, and accidental dental injury. This type of insurance is required of all students playing varsity sports, students who are not Canadian

citizens, and may be required by individual academic departments for participation in laboratory classes.

Residence and Food Service

Accommodation and dining facilities are available for up to 350 students in co-education and single sex arrangements. Three residences, Chapman, Fraser and Trueman, are equipped with private and shared accommodation, modern laundry facilities, mail delivery and student lounge/games room. Each room is equipped with such basic furnishings as: bed, mattress, desk, chair, closet and drapes. Students are encouraged to develop their social and personal potential through participation in House Council, Student Union and Student Services activities.

An alternative student accommodation is being offered at Fundy Residence, AgriTECH Park. Fundy features apartment-like living with your peer group (of ten) in large, bright, newly renovated rooms. Each section (apartment) includes a full equipped kitchen/sitting room with cable TV, microwave,

laundry room, storage area and private washrooms and showers.

Dining Services for on-campus students, provide a balanced, healthy menu from which students may choose a variety of main course and dessert items. Special meals are held to celebrate many special occasions such as Thanksgiving, Christmas, etc.

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.

ADMINISTRATION AND FACULTY

ADMINISTRATIVE OFFICERS

Principal

H.G. Coffin, B.Sc.(Agr.) (McGill), M.Sc.,
Ph.D. (Connecticut)

Vice-Principal Academic

E.B. Burnside, B.S.A., M.S.A. (Toronto),
Ph.D. (North Carolina)

Associate Vice-Principal Academic

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

Vice-Principal Administration

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

Registrar

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

Assistant Registrar

A.L. Sibley

Dean of Student Services

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

Assistant Dean Career Services and Awards

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

Assistant Dean Health Services

J.K. Peebles (RN)

Assistant Dean Judicial

J. Hoyle, B.A. (Univ. Yorke), B.A. (Open
Univ., U.K.), B.Ed. (Dalhousie), M.Sc. (Leeds),
Ph.D. (Dalhousie)

Coordinator of Research & Graduate Studies

J.L. Rogers-Langille, B.Sc.(Guelph), B.Ed. (Brock),
M.Sc. (Dalhousie/NSAC)

Chief Librarian

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

Director of Athletics

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

Director of Continuing Education

M.B. Johnstone, B.A. (St. Francis Xavier),
M.A. (McMaster)

Director of International Development

W. Radford, B.A., P.G.C.E., M.Ed. (Leeds)

Business Manager

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

Publications and Alumni Affairs

S.L. Brown, B.A. (UNB), B.PR. (MSVU)

Administrative Secretary

T.E. Blois

FACULTY

Principal

H.G. Coffin, B.Sc.(Agr.) (McGill), M.Sc.,
Ph.D. (Connecticut)

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.(Sask.)
-Professor

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

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

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

Animal Science

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

E.B. Burnside, B.S.A., M.S.A. (Toronto),
Ph.D. (North Carolina)
*-Vice-Principal Academic and
Professor*

J.D. Castell, B.Sc., M.Sc. (Dalhousie),
Ph.D. (Oregon)
-Adjunct Professor

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

J. Duston, B.Sc. (Bath), Ph.D. (Aston)
-Assistant Professor

C.T. Enright, M.Sc.,MBA, Ph.D. (Dalhousie)
-Associate Professor

A.H. Farid, B.Sc., M.Sc. (Shiraz), Ph.D.(Alberta)
-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)
-Professor
- K.E. Glover, B.Sc.(Agr.), M.Sc. (Guelph), Ph.D.
(Dalhousie)
-Adjunct Professor
- P.Y. Hamilton, B.Sc. (Agr.) (McGill),
M.Sc. (Maine)
-Professor Emeritus
- R.M.G. Hamilton, B.Sc. (Agr.),
M.Sc.(Agr.) (McGill), Ph.D.(Western)
-Adjunct Professor
- 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)
-Professor
- L.A. MacLaren, B.Sc. (Agr.) (Guelph),
M.Sc. (Alberta), Ph.D. (California)
-Associate Professor
- W.G. Mathewson, B.Sc., M.Sc.(Aberdeen)
-Professor Emeritus
- D.L. Patterson, B.Sc. (Alberta), M.Sc.,
Ph.D. (Guelph)
-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
- L.A. Scott, B.Sc.(NSAC), B.Ed.(Mt.A.)
-Lecturer
- A.J. Teale, M.A., Vet.,M.B. (Cambridge),
M.Sc.,Ph.D., M.R.C.V.S.(Edinburgh)
-Adjunct Professor
- T. Tennessen, B.A., B.Sc., M.Sc., Ph.D. (Alberta)
-Professor
- J.J. Tosh, B.Sc.(Guelph), M.Sc. (Manitoba),
Ph.D. (Guelph)
Assistant Professor

Economics and Business Management

- S.G. Russell, B.Sc. (Agr.) (Guelph),
M.B.A. (St. Mary's)
-Associate Professor and Head
- J.S. Clark, B.A. (Guelph), M.Sc. (Sask.),
Ph.D. (North Carolina)
-Associate Professor
- D.M. Dunlop, B.Sc. (Agr.) (Nova Scotia
Agricultural College), M.Sc. (Alberta),
-Assistant Professor
- 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
- E.K. Yiridoe, B.Sc. (Un of Science & Technology,
Ghana), M.Sc., Ph.D. (Guelph)
-Assistant Professor

Environmental Sciences

- G. Boiteau, B.Sc., M.Sc. (Laval),
Ph.D. (North Carolina)
-Adjunct Professor
- M.R. Carter, B.Sc. (Agr.), M.Sc. (Alberta),
Ph.D. (Saskatchewan)
-Adjunct Professor
- L.E. Crosby, B.Sc., M.Sc. (Acadia)
-Associate Professor
- N.L. Crowe, B.Sc. (Agr.), M.Sc. (McGill),
Ph.D. (Guelph)
-Associate Professor
- L.J. Eaton, B.Sc. (Acadia), M.Sc.,
Ph.D. (Dalhousie)
-Oxford Frozen Foods, Ltd. Research Professor
- A.B. Gray, B.Sc. (Bishops), M.Sc., Ph.D. (McGill)
-Associate Vice-Principal Academic and Professor
- J. Hoyle, B.A. (Univ. York), B.A. (Open Univ., U.K.),
B.Ed. (Dalhousie), M.Sc. (Leeds),
Ph.D. (Dalhousie)
-Professor
- W.M. Langille, B.Sc. (Acadia), M.Sc. (McGill)
-Professor Emeritus
- J.-P.R. Le Blanc, B.A. (Montreal), B.Sc. (Quebec),
Ph.D. (McGill)
-Professor
- M.P. Merrin, B.Sc. (London, Kings College),
Ph.D. (Dalhousie)
-Assistant Professor
- V.O. Nams, B.Sc. (Toronto), M.Sc.
(Alberta), Ph.D. (Victoria)
-Associate Professor
- A.R. Olson, B.A. (Augustana), M.Sc.
(Wisconsin), Ph.D. (Alberta)
-Professor
- A.S. Payne, B.Sc. (Agr.), M.Sc. (McGill)
-Associate Professor
- D.C. Percival, B.Sc. (Agr.), M.Sc., Ph.D. (Guelph)
-Wild Blueberry Research Professor
- A.R. Robinson, B.Sc. (Agr.), M.Sc., Ph.D. (McGill)
-Professor
- V.Rodd, B.Sc.(UPEI), M.Sc.(Manitoba)

-Affiliated Researcher

- 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
- W. Threlfall, B.Sc., Ph.D. (Wales)
-Adjunct Professor
- P.R. Warman, B.Sc.(Agr.)(Rutgers), M.Sc., Ph.D. (Guelph)
-Professor

Mathematics, Physics and Humanities

- T. Astatkie, B.Sc., M.Sc. (Addis Ababa), Ph.D. (Queen's)
- Associate Professor
- K.B. Beesley, B.E.S., Ph.D. (Waterloo)
-Professor
- D.G. Bishop, B.Eng. (Agr.), M.Eng. (Agr.)(Technical University of Nova Scotia)
-Associate Professor
- P. Cox, B.A. (Acadia), M.A. (Toronto)
-Professor Emeritus
- R.G. Farmer, B.B.A. (U.C.C.B.), M.B.A. (St. Mary's)
-Associate Professor
- A. Georgallas, B.Sc.(Queen Elizabeth College), Ph.D.(London)
-Associate Professor
- R.J. Gordon, B.Sc., M.Sc. (McGill), Ph.D. (Guelph)
-Adjunct Professor
- A. Kernohan, S.B. (Mass Inst. of Technology), M.Sc., Ph.D. (Toronto), M.A. (Dalhousie)
- Adjunct Professor
- R.H. Loucks, M.Sc. (U.B.C.), Ph.D. (Michigan)
-Adjunct Professor
- K. MacRae, B.Ed. (British Columbia), M.Sc., Ph.D. (Oregon)
-Adjunct Professor
- C.T. Madigan, B.Sc., M.Sc. (Windsor)
-Associate Professor
- G.J. Pearson, B.Sc., M.Sc. (Queens), B.Ed. (Dalhousie)
-Associate Professor
- L.L. Sanderson, B.Sc. (Agr.), M.Sc. (Guelph)
-Associate Professor
- J.M. Smith, B.P.Ed. (Dalhousie)
-Assistant Professor

Plant Science

- J Nowak, M.Sc., Ph.D., Ph.D.habil. (Olsztyn)
-Professor and Head
- S.K. Asiedu, B.Sc. (Agr.), M.Sc., Ph.D. (McGill)
-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
- G.R. Brewster, B.A., M.Sc., Ph.D. (Western Ontario)
-Associate Professor
- C.D. Caldwell, B.Sc. (Mt. Allison), M.Sc. (Dalhousie), Ph.D. (East Anglia)
-Professor
- D.J. Cattani, B.Sc. (Agr.), M.Sc. (Manitoba)
-Turfgrass Research Professor
- M. Chiappe, Ing. Agr. (Uruguay) M.A., Ph.D. (Minnesota)
-Adjunct Professor
- B.R. Christie, B.S.A. (Guelph), M.S.A. (Toronto), Ph.D. (Iowa)
-Adjunct Professor
- R.H. Coffin, B.Sc.(Agr.), M.Sc.(McGill), Ph.D. (Guelph)
-Adjunct Professor
- 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
- R.Donald, B.Sc.(Mt.A.), M.Sc.(Guelph), Ph.D. (Saskatchewan)
-Research Associate
- D.J. Doohan, B.Sc. (Agr.) (Guelph), M.Sc., Ph.D. (North Carolina)
-Adjunct Professor
- C.G. Embree, B.Sc. (Agr.) (Guelph), 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

- N.L. McLean, B.Sc.(Agr.), M.Sc. (Macdonald),
Ph.D. (Dalhousie)
-Adjunct Professor
- L.R. Mapplebeck, B.Sc., M.Sc. (Guelph)
-Associate Professor
- R.C. Martin, B.A., M.Sc. (Carleton), Ph.D. (McGill)
-Associate Professor
- J.C. Miller, B.Sc. (Agr.) (Guelph), M.Sc. (Alberta)
-Associate Professor
- J. Morton, B.Sc.(Agr.), M.Sc. (Guelph)
-Adjunct Professor
- Y. Papadopoulos, B.Sc., M.Sc., Ph.D. (Guelph)
-Adjunct Professor
- H.W. Platt, B.Sc. (Manitoba), Ph.D. (Saskatchewan),
Post-doctorate (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
- T.D. Smith, B.Sc., M.Sc.F. (New Brunswick),
Ph.D. (McGill)
-Associate Professor
- A.V. Sturz, B.Sc. (Newcastle-u-Tyne),
Ph.D. (Manchester)
-Adjunct Professor
- J.M. Wright, B.Sc. (Mount Allison), Ph.D.
(Memorial)
-Honorary Research Associate

INDEX	
Academic Regulations	
Academic Residency Requirements	18
Academic Responsibility	14
Academic Standing	13
Dropping Courses	16
Challenge for credit	15
Deferred examinations	17
Examination regulations	16
Plagiarism	19
Required to Withdraw	13
Supplemental Examinations	10, 17
Transcripts	10, 12
Acceptance: Early	7
Final	7
Academic Calendar	5
Academic Probation	8, 13, 16
Administration and Faculty	144
Admission	
Deadlines	8, 113
English proficiency	8
Full-Time	7, 116
Mature students	7
No Program	7
Part-Time	7
Procedures	7, 13, 14, 15
Readmission	19
Requirements:	
Graduate Program	113
Technician and Technology	8
Undergraduate	8
Visiting	16
Submission of documents	7
TOEFL	8
Advanced Placement Exam	14
Advanced Standing	14
Advisors	12
Agricultural Engineering	
Course Descriptions	67
Animal Science	
Course Descriptions	72
Appeal	
of Grades	18
of Required to Withdraw	14
Application to Graduate	18
Athletics	
Facilities	15, 142
Fees	10
Insurance	19
Regulations	14
Attendance in class	14
Audit	10, 15
Bachelor of Science (B.Sc.(Agr.)):	
Admission	8
General	22, 141
Majors	23
Minors	23
Bachelor of Technology:	
Admission	8
General	22
Majors	8
Biology Course Descriptions	81
Books	10
Canada Student Loans	12
Career Services	142
Centre for Continuing and Distance Education	139
Challenge for Credit	15
Chemistry and Soil Science	
Course Descriptions	86
Churches	141
College Colours	142
Course Descriptions:	
Agricultural Engineering (AE)	67
Animal Science (AS)	72
Biology (B)	81
Chemistry and Soil Science (CS)	86
Economics and Business Mgt (EB)	92
Graduate (AG)	119
Humanities (H)	97
Interdepartmental (IN)	100
Mathematics and Physics (MP)	102
Plant Science (PS)	105
Convocation	6, 118
Cumulative Grade Average	13
Dates, Schedule of	5
Day Care	141
Deadlines	8, 16, 20, 117
Deferred Examinations	17
Diplomas	18, 19
Drop Failures	16, 20
Dropping a Course	16
Economics and Business	
Course Descriptions	92
Engineering	
Engineering Diploma	19
Environmental Sciences Dept.	145
Examinations	16
Deferred	17
Regulations	16
Rereading	17
Supplemental	17
Exchange Program	18, 51
Facilities	142
Fees	
Athletics	10
Caution/Development Fund	10
Change in	12
Foreign students	10
Graduate program	115

Graduation fee	10	Agricultural Business	30
House	11	Agricultural Chemistry	32
Key deposit	10	Agricultural Economics	34
Laundry	11	Agricultural Mechanization	36
Materials and service	10	Agrifood Products	38
Meal Plan	11	Mathematics	42
Medical Insurance	10	Plant Science	42
Official Transcript	10, 12	Rural Studies	44
Refund of	12	Soil Science	45
Registration Deposit	11	Mission Statement	4
Residence	11	No Program Students	7
Student Union	10	On-site & Distance Delivery	139
Supplemental Examination	10	Part-time Students	7
Transcript	10, 12	Plagiarism	19
Tuition	10	Plant Science	
Workterm	10	Course descriptions	105
Food Service	143	Permit to Register	20
Foreign Students	7	Post Office Address	142
Full-time Students	7	Principal's List	16
Fundy Residence	11	Probation	8
General Information	139	Professional Organizations	22
Governor-General's Medals	125	Program Codes	21
Grades	18	Programs	
Appeals	18	Graduate:	
Release of Final Grades	18	Master of Science in Agriculture	112
Graduate Course descriptions	119	Technician:	
Graduate/Mature Student		Agricultural Business	52
Housing	11	Animal Science	54
Graduate Program	112	Bio-resources Engineering	55
Graduate Course Descriptions	119	Plant Science	56
Recommended Regular Courses	119	Technology:	
Required Regular Courses	119	Animal Health	59
Other Regular Courses	119	Agricultural	64
Cross-Referenced Courses	119	Biology	60
Graduation		Chemistry Laboratory	61
Application to Graduate	10, 18, 118	Farming	64
Fees	10, 18	Food Quality	62
Health Insurance	19	Landscape Horticulture	63
Health Services	142	Undergraduate:	
High Honours	19	Bachelor of Science in	
Honours	19	Agriculture	23
Humanities		AgBioTechnology	29
Course descriptions	97	Agribiology: Environmental	
Interdepartmental		Biology	25
Course descriptions	100	Agribiology: Pest	
Interest Charges	10	Management	27
International Baccalaureate	14	Agricultural Business	30
Leave of Absence	115	Agricultural Chemistry	32
Letter of Permission	19	Agricultural Economics	34
Mathematics and Physics		Agricultural Mechanization	36
Course descriptions	102	Agrifood Products Minor	38
Math, Physics & Humanities Dept.	146	Animal Science	39
Mature Students	7	Aquaculture	40
Minors	23	Mathematics Minor	42
Agribiology: Environmental Biology	25	Plant Science	42
Agribiology: Pest Management	27	Rural Studies Minor	44

Soil Science	45
Bachelor of Engineering	47
Bachelor of Technology	66
Engineering Diploma	47
Biosystems	48
Chemical	48
Civil	48
Electrical	48
Environmental	48
Industrial	48
Mechanical	48
Metallurgical	48
Mining	48
Pre-vet Medicine	50
Registration	
Procedures	20
Cancellation or Withdrawal	20
Deadlines	20
Fee payment	20
Telephone	20
Release of Final Grades	18
Reread of an Exam	17
Residence	
Mature Students	11
Regulations	20
Room Draw	11
Residency Requirement	18
Regulations & Procedures	13
Returning Students	20
Required to Withdraw	13, 14, 115
Appeal	14
Schedule of dates	5
Schedule of fees	10
Scholarships, Bursaries and Prizes	125
Second Diploma	19
Semester Grade Average	14
Statement of Values	4
Student Categories	7
Student Safety	20
Student Government	143
Student Services	142
Supplemental Exams	17
Technician Programs	51
Technology Programs	58
Telephone Registration	20
Terms and Codes	21
Transcripts	20
Transfer Credits	15
Tuition Fees	10
Refunds	12
Unclassified Students	16
U.S. Students	9
Visiting Students	16
Withdrawals	12, 20



Office of the Registrar
Nova Scotia Agricultural College
P.O. Box 550, Truro, Nova Scotia Canada B2N 5E3
Phone: (902) 893-6722 Fax: (902) 895-5529
Email: reg_info@www.nsac.ns.ca
Online: <http://www.nsac.ns.ca>

