

THE COLLEGE OF AGRICULTURE AND LIFE SCIENCES

<http://www.uvm.edu/~cals/>

The programs of the College of Agriculture and Life Sciences (CALS) emphasize life sciences, agriculture and food systems, environmental protection, and the preservation of healthy rural communities. In cooperation with the Agricultural Experiment Station and the University of Vermont Extension Service, the college performs the four public functions of teaching, research, disseminating information, and providing related services.

As an integral part of the University of Vermont, the College of Agriculture and Life Sciences helps fulfill the university's mission to discover, interpret and share knowledge; to prepare students to lead productive, responsible, and creative lives; and to promote the application of relevant knowledge to benefit the State of Vermont and society as a whole.

The college faculty strive for excellence in undergraduate education as evidenced by a sustained and enviable record of university teaching award winners. The college emphasizes the importance of each individual student and promotes significant student-faculty interaction. Students are provided with a firm foundation in the social and life sciences in order to excel and meet the challenges in future professional careers. Faculty and peer advisors provide a broad range of support to help students develop high-quality academic programs that meet individual needs.

Applying knowledge outside the classroom is a signature of all CALS programs. Opportunities abound for on and off campus experiences such as internships, community service learning, undergraduate research, independent study, and study abroad. Pre-professional tracks prepare students for employment upon graduation or for successful pursuit of advanced degrees. Career choices are broad, but focus primarily on agribusiness, dietetics, international and rural development, agriculture, veterinary and human medicine, biotechnology, nutrition, research and teaching, horticulture, and the plant sciences.

Academic study is enhanced by the on-campus and field facilities, the labs, and the research for which the college is renowned. Many CALS faculty, working through the Agricultural Experiment Station, conduct mission-oriented, applied research and encourage undergraduate participation.

The office of the dean of the college is located in Rooms 106 and 108 in Morrill Hall. For more information, contact the Student Services office at calsstudentservices@uvm.edu or call (802) 656-2980.

CALS CORE COMPETENCIES

Students in the College of Agriculture and Life Sciences develop a set of knowledge, skills, and values through satisfactory completion of an integrated series of courses and academic experiences such as internships and research apprenticeships. CALS believes these

competencies are essential to effectively function in society and that they foster an attitude that promotes lifelong learning and responsible citizenship.

A. Knowledge

Students develop a fundamental base of knowledge that will serve as a foundation for lifelong learning.

SCIENCE

Students use the scientific method to understand the natural world and the human condition.

PHYSICAL AND LIFE SCIENCES

Competency may be met by satisfactory completion of two courses in subjects such as anatomy, animal science, biology, chemistry, ecology, entomology, food science, forestry, geology, horticulture, genetics, microbiology, nutrition, physics, physiology, plant biology, and soil science.

SOCIAL SCIENCES

Competency may be met by satisfactory completion of two courses in subjects such as anthropology, community development, economics, geography, history, political science, public policy, psychology, and sociology.

HUMANITIES AND FINE ARTS

Students develop an understanding and appreciation for the creative process and human thought. Competency may be met by satisfactory completion of two courses in subjects such as art, classics, history, literature, music, philosophy, religion, language, and theatre.

B. Skills

Students develop abilities and use tools to effectively communicate, analyze, problem solve, think critically, and work well with others.

COMMUNICATION SKILLS

Students express themselves in a way that is easily understood at a level that is appropriate for the audience.

- **Oral:** Students show confidence and efficacy in speaking before a group. Competency may be met by satisfactory completion of two courses: CALS 001 or CALS 183 (or equivalent), where the primary focus is public speaking; and an additional course or series of courses in which students present a minimum of three graded speeches to a group.
- **Written:** Students communicate effectively in writing. Competency may be met by satisfactory completion of ENGL 001 or ENGL 050 or HCOL 085, and an additional course or series of courses that uses the writing process (redrafting) for a minimum of three graded papers.

INFORMATION TECHNOLOGY

Students demonstrate mastery of technology for communication, data gathering and manipulation, and information analysis.

Competency may be met by satisfactory completion of one course: CALS 002 or CALS 085 (or equivalent).

QUANTITATIVE SKILLS

Students demonstrate the ability to use numbers and apply and understand statistical methods.

- **Mathematics:** Students demonstrate the use of numbers for problem solving. Competency may be met by satisfactory completion of one course: MATH 009 or higher.
- **Statistics:** Students demonstrate the use of numbers for data analysis and inference. Competency may be met by satisfactory completion of one course: STAT 111 or higher or equivalent.

CRITICAL THINKING SKILLS

Students demonstrate ability to comprehend, judge, and present written/oral arguments and to solve problems. Students learn how to distinguish between fact, conjecture, and intuition.

INTERPERSONAL SKILLS

Students demonstrate the ability to work well with other people by understanding and using skills of leadership, conflict resolution, and group process.

C. Values

Students are exposed to values that are expressed through relationships with community, the environment, and themselves that are consistent with the mission of the College of Agriculture and Life Sciences and the University of Vermont campus compact known as "Our Common Ground."

CITIZENSHIP AND SOCIAL RESPONSIBILITY

Students develop an understanding, appreciation, and empathy for the diversity of human experience and perspectives. Students are exposed to solving problems for a community and contributing to the common good.

ENVIRONMENTAL STEWARDSHIP

Students develop sensitivity for the interconnected relationship between human beings and the natural world and the responsibility for stewardship of the environment.

PERSONAL GROWTH

Students develop an understanding and appreciation of a healthy lifestyle and a love for learning that will lead to continuous growth and development throughout their lives. Students continue to improve themselves by developing and affirming the values of respect, integrity, innovation, openness, justice, and responsibility.

DISTINGUISHED UNDERGRADUATE RESEARCH (DUR) COLLEGE HONORS PROGRAM

The CALS Academic Awards committee promotes and encourages independent research by recognizing those students who especially excel in their creative, innovative, responsible, and independent

pursuit of research. DUR Committee Guidelines for student projects may be obtained in the Student Services office in Morrill Hall or they are available on the CALS website.

Independent research can be an important aspect of a student's education. Scientific research, independent projects, and internships or field practice are examples of independent research which benefit students as they pursue graduate study or seek employment. Over the years a number of undergraduate research projects have been published in well-known scientific journals and manuals, videotapes, and other products of special projects have been incorporated into classes to enhance the learning environment in the college.

The completed research, in a form appropriate to the discipline, is evaluated first by a departmental review committee. Independent research of the highest quality will be chosen for college Honors by the Academic Awards committee. Students are recognized at the CALS Honors Day.

HONORS PROGRAM

The CALS Honors program is a four-year Honors sequence for CALS students who are accepted into the university Honors College. It is designed for highly qualified and motivated students desiring an academically challenging undergraduate experience in the broad areas of the life sciences and agriculture.

In their first two years, Honors scholars will join Honors students from across the university in small, interdisciplinary Honors seminars conducted by renowned scholars from the University of Vermont and other institutions. In their junior and senior years, Honors scholars do Honors work within the College of Agriculture and Life Sciences. The program culminates with an Honors thesis: an opportunity to conduct independent scholarly research under the guidance of a faculty advisor.

Entering first-year students with outstanding academic records will be invited to participate in the Honors College. Scholars will be required to maintain a minimum grade-point average, participate in program activities, enroll in Honors classes and successfully complete a Senior Honors thesis.

Students in CALS who demonstrate academic excellence during their first year may apply for sophomore admission to the Honors College.

PRE-MEDICAL AND PRE-VETERINARY OPPORTUNITIES

Pre-Medical Enhancement Program

The Pre-Medical Enhancement Program (PEP) is a joint offering of the College of Arts and Sciences, the College of Agriculture and Life Sciences, and the College of Medicine to provide enhanced opportunities for a select group of highly qualified pre-medical students. Interested students apply to PEP in the second semester of their first year. Those students accepted into PEP will be assigned a practicing physician-mentor who will introduce the concepts of patient care and practice management through regularly scheduled

office-based/ clinical experiences. The PEP coordinator in the College of Medicine will provide information on opportunities for medical research experience and volunteer/employment possibilities in the health sciences or health policy fields. On a monthly basis, students will receive listings about special educational offerings at the College of Medicine and the Academic Medical Center. PEP students will also be able to participate in practice interviews with members of the University of Vermont Pre-Medical committee. In their junior year, PEP students will be able to apply to the University of Vermont College of Medicine.

Pre-Veterinary Opportunities

UVM/TUFTS SCHOOL OF VETERINARY MEDICINE PROGRAM

Tufts University Cummings School of Veterinary Medicine offers undergraduates at UVM an opportunity to apply for admission in the spring of their sophomore year. A limited number of students are admitted; they are guaranteed a space in the veterinary school class once they graduate if they have maintained the required grade-point average upon graduation.

Participants in this program are offered the assurance of veterinary school admission without the substantial investments of time and energy that other pre-veterinary students typically make in the process of preparing, researching, and applying to numerous veterinary schools and preparing for optimal scores on the GRE. Program participants can select any undergraduate major, explore other areas of interest during their junior and senior years or choose to study abroad, thus broadening their undergraduate experience.

To be eligible to apply, candidates for this program must be sophomores and must have demonstrated academic proficiency in their course work, particularly in the pre-veterinary science courses.

It is expected that competitive applicants will have:

- Completed at least two science sequences (most typically the year of introductory chemistry and the year of introductory biology) by the spring semester of their sophomore year.
- Completed prerequisite courses at their undergraduate institution or at other universities by special permission of the veterinary school's admissions office.
- Achieved a highly competitive cumulative grade-point average.

AP credit is acceptable as long as it appears on the student's transcript. The GRE is not required for applicants to this joint program; the applicant's SAT scores will be considered during the admissions process.

For more details on the application process and program requirements, visit the Pre-veterinary Information for Prospective Students on the Department of Animal Science website.

UVM/ONTARIO VETERINARY COLLEGE

The University of Vermont and the University of Guelph Ontario Veterinary (OVC), an accredited veterinary school which provides a degree in Doctor of Veterinary Medicine, have an agreement whereby OVC will hold two places in the first year of the program for students from the University of Vermont who meet the requirements for admission. These places may not be occupied by students who are Canadian citizens or who hold Canadian Permanent Residency status. The places will be held until the end of March for entrance in September of the same year.

Students may apply for admission to the program via the Veterinary Medical College Application Service or directly to OVC through its normal application process for international applicants. For admission, students must have a minimum GPA of 3.00 in the sciences and meet the minimum score for the Graduate Record exam (GRE). Additional course work includes two semesters each of inorganic chemistry, organic chemistry, physics, and biology (all with labs) and one semester each of calculus, statistics, biochemistry, genetics, and cell biology. Applicants must have a minimum of fifteen credits in each of their eight semesters of undergraduate work at UVM.

UVM/ROYAL (DICK) SCHOOL OF VETERINARY STUDIES, THE UNIVERSITY OF EDINBURGH (UOE, R(D)SVS) PLACEMENT AGREEMENT

The University of Vermont (UVM) and the Royal (Dick) School of Veterinary Studies, the University of Edinburgh (UoE, R(D)SVS) have entered into an early entrance admission placement program that will make available three guaranteed places for UVM early application students. Application to the UoE, R(D)SVS early admission program can be made at the end of the second year (four semesters) with predetermined science and math courses completed and a minimum GPA of 3.40. If accepted, the 3.40 or above GPA has to be maintained until the time of graduation. Admitted students must receive adequate animal handling experience throughout their residence at UVM. The type of experience required can be coordinated between the student and the UoE, R(D)SVS. Opportunity will exist to credit some components of UVM teaching in animal husbandry and animal handling as accredited prior learning for the Edinburgh degree. Advice will be given by UoE, in consultation with UVM, as to what courses can be credited. If requested, opportunity to undertake a four week vacation clinical placement (companion animal and/or equine) at R(D)SVS will be available to all students in the program.

UVM/UNIVERSITY OF GLASGOW MATRICULATION AGREEMENT

The University of Glasgow (UoG), Glasgow, UK and the University of Vermont (UVM), Burlington, VT USA have formed an agreement whereby University of Vermont students can complete a joint B.S./BVMS degree attending UoG in their fourth year at UVM. UVM may send 5-10 students yearly who have successfully completed three years of study in the University of Vermont Animal and

Veterinary Sciences Bachelor of Science (B.S.) program to the Bachelor of Veterinary Medicine and Surgery programme (BVMS) hosted by the School of Veterinary Medicine, College of Medical, Veterinary and Life Sciences at Glasgow. Participating students will continue as candidates for degrees from their home institution (UVM) and will not, at the end of the first year at UoG, be eligible candidates for degrees from the host institution (UoG). Credit for subjects taken at UoG will be transferred to UVM to fulfill the requirements for awarding successful students a B.S. degree in Animal and Veterinary Sciences from UVM at the end of their fourth year. University of Vermont students meeting matriculation requirements and successfully completing Year 1 of the BVMS program at the University of Glasgow will be offered a direct entry place in Year 2 of the BVMS program. Applications from University of Vermont students to study at UoG must reach UoG by 1 January for commencement in September of that year.

MAJORS

- Animal and Veterinary Sciences B.S.
- Biochemistry B.S.
- Biological Science B.S.
- Community Entrepreneurship B.S.
- Community and International Development B.S.
- Dietetics, Nutrition and Food Sciences B.S.
- Ecological Agriculture B.S.
- Environmental Sciences B.S.
- Environmental Studies B.S.
- Microbiology. B.S.
- Molecular Genetics B.S.
- Nutrition and Food Sciences B.S.
- Plant Biology B.S.
- Public Communication B.S.
- Self-Designed B.S.
- Sustainable Landscape Horticulture B.S.

MINORS

- Animal and Veterinary Sciences
- Applied Design
- Biochemistry
- Community and International Development
- Community Entrepreneurship
- Consumer Affairs
- Consumer and Advertising
- Ecological Agriculture
- Environmental Studies
- Food Systems
- Green Building and Community Design
- Microbiology
- Molecular Genetics

- Nutrition and Food Sciences
- Plant Biology
- Public Communication
- Soil Science
- Sports Management
- Sustainable Landscape Horticulture

REQUIREMENTS

MAJOR DEGREE REQUIREMENTS

All programs in the College of Agriculture and Life Sciences lead to the Bachelor of Science degree and require:

1. The successful completion of a minimum of 120 credits of course work.
2. A minimum cumulative grade-point average of 2.00.
3. Completion of the CALS Core Competencies.
4. CALS 001 and CALS 002 (Foundations) or equivalent courses.
5. The university requires two courses addressing diversity for all incoming first-year and incoming transfer students. At least one course must be completed from the Category One list. These diversity credits will also satisfy six of the twelve social science and humanities requirements for the college.
6. The University requires all undergraduates to meet the Sustainability General Education Requirement for the University of Vermont. To meet this requirement, students must complete a course, curriculum, or co-curriculum prior to graduation that has been approved by the Faculty Senate's Sustainability Curriculum Review Committee.
7. All courses as specified in individual program majors.

The applicability of courses to specific areas of study is based on content and not departmental label. Applicability of courses to fulfill requirements rests with the student's advisor and, if necessary, concurrence of the dean of the college.

PRE-PROFESSIONAL PREPARATION

Students striving for admission to professional colleges, such as dentistry, medicine (including naturopathic), chiropractic, osteopathic, and veterinary medicine, can meet the undergraduate requirements for these programs through enrollment in CALS majors. The Pre-Veterinary/Pre-Professional Science option is advised through the Animal Science major. Upon admission, each student will be assigned a faculty advisor knowledgeable in pre-professional preparation. Competition for admission to professional schools is very keen, and a superior academic record throughout an undergraduate program is necessary to receive consideration for future admission. Due to the intense competition, only a small percentage of those first-year students declaring an interest in professional schools are eventually admitted after completion of the baccalaureate. Consequently, students must select a major, in an area of their choice, to prepare them for a career other than medical sciences. The pre-professional requirements will be met concurrently

with the major requirements for the B.S. degree. Students interested in human medical sciences often enroll in biochemistry, biological sciences, nutrition and food sciences, microbiology or molecular genetics. Those interested in veterinary medicine usually enroll in animal science or biological science.

Each student prepares a four-year program of courses, with the guidance of a faculty advisor, to meet requirements for a B.S. degree in their major. It is recommended that students complete the following courses to meet minimum requirements of most professional schools. It is the responsibility of each student to contact the professional schools of their choice to determine the exact entrance requirements.

Human Medical and Dental Schools

Biology with laboratory		
Choose one of the following sequences:		8
BIOL 001 & BIOL 002	Principles of Biology and Principles of Biology	
BCOR 011 & BCOR 012	Exploring Biology and Exploring Biology	
Chemistry with laboratory		
Inorganic Chemistry:		8
CHEM 031	General Chemistry 1	
CHEM 032	General Chemistry 2	
Organic Chemistry:		8
CHEM 141	Organic Chemistry 1	
CHEM 142	Organic Chemistry 2	
Physics with laboratory		
With math:		10
PHYS 011 & PHYS 021	Elementary Physics and Introductory Lab I	
PHYS 012 & PHYS 022	Elementary Physics and Introductory Lab II	
With calculus:		8
PHYS 051	Fundamentals of Physics I	
PHYS 152	Fundamentals of Physics II	
Mathematics (requirement varies)		
MATH 019	Fundamentals of Calculus I	3
MATH 020	Fundamentals of Calculus II	3
Biochemistry		
BIOC 212	Biochemistry of Human Disease	3

Humanities, Social Sciences, Languages		
Students must complete the minimum college requirements in this area that includes English composition and speech. Advanced composition and additional courses in this area are encouraged as time allows.		

Veterinary Medical Schools

All of the courses listed above under Human Medical and Dental Schools plus:

Biochemistry		
PBIO 185 & PBIO 187	Biochem for Life & Health Sci and BiochemLab for Life&Health Sci	4
Written English		
Choose two of the following:		6
ENGS 001	Written Expression	
ENGS 050	Expository Writing	
ENGS 053	Intro to Creative Writing	
Genetics		
BCOR 101	Genetics	3
or ASCI 168	Animal Genetics	
Microbiology		
MMG 101	Microbiol & Infectious Disease	4
Nutrition		
ASCI 110	Animal Nutrit, Metab & Feeding	4

Several schools require a course in introductory animal sciences, vertebrate embryology, immunology, molecular genetic cell biology or statistics. Students should consult their advisor regarding specific requirements for various veterinary schools.

Finally, both human and veterinary medical schools want to see a history of interest in medicine. It is important for students to work with physicians or veterinarians and gain first-hand knowledge of their chosen profession. Volunteer or paid work in hospitals, nursing homes or emergency centers is important. Commercial farm experience is also valuable for pre-veterinary students.

Students applying to CALS who express an interest in medicine or pre-veterinary medicine should present evidence of high performance in high school level science and mathematics courses, plus additional supporting documentation such as high SAT scores, strong letters of recommendation, and a motivational summary statement.

REGULATIONS

GOVERNING ACADEMIC STANDARDS

The College of Agriculture and Life Sciences Studies committee reviews the semester grades of all students in the college whose

semester or cumulative grade-point average falls below the 2.00 minimum, as well as the academic progress of all students placed on academic probation the previous semester. Detailed information may be obtained from the CALS Student Services office, 106 Morrill Hall, (802) 656-2980.

Guidelines

A student whose semester grade-point average falls below a 2.00 will be placed “on trial” and will be given a target semester average to achieve by the end of the following semester. A student whose semester grade-point average is below a 1.00 or who fails to achieve the stated target average while “on trial”, may be placed on “intermediate trial.” Any student with a prolonged history of poor grades, including students who consistently fail to achieve the target semester average, may be placed on “final trial”. A student who does not achieve the target semester grade-point average while on “final trial” is a candidate for dismissal from the university.

Additional Guidelines for CALS Academic Probation

Any student who has been dismissed can return to the College of Agriculture and Life Sciences assuming the student has satisfied the stipulations stated in their dismissal letter. Upon re-entry to the university, the student will be placed on “intermediate trial” and will not be allowed to take more than twelve credits during the semester in which they are re-admitted.

If a student is dismissed twice during their undergraduate degree program, the student will be required to take one academic year off as a matriculated student. During this period, courses may be taken through Continuing Education at the University of Vermont or elsewhere. Upon re-entry to the university, the student will be placed on “intermediate trial” and will not be allowed to take more than twelve credits during the semester in which they are re-admitted.

If the student is dismissed for a third time, the dismissal is final and cannot be appealed. Readmission to the university will only be permitted if the student is granted an Academic Reprieve. Please refer to the Academic Reprieve section under Academic and General Information in this catalog for details on this policy.

Appeal

A student may appeal a dismissal to the CALS Studies Committee by direction of the dismissal letter. The student will be asked to appear in person before the Studies Committee to appeal the case.

Continuing Education and Readmission

A student who has been dismissed from the college may take up to six credits of course work through UVM Continuing Education or another institution in an attempt to improve his/her grades. To gain readmission to the college, the student must achieve no less than a 2.67 semester average on the six credits. If six credits are to be taken at another institution, the student should work with the UVM Office of Transfer Affairs to ensure transferability.