

AGRICULTURAL SCIENCES (BS)

College of Agriculture and Life Sciences

Program Website (<https://cals.cornell.edu/education/degrees-programs/agricultural-sciences-major/>)

CIP: 01.0000 | HEGIS: 0101.00 | NYSED: 30258

Program Description

Cornell University ranks consistently in the top five institutions for agricultural sciences, offering a flexible major that adapts to your career goals through focus areas such as animal science, agri-business management and policy, sustainable cropping systems and soil health management. Your journey begins with a collaborative first-semester cohort course developing essential critical thinking skills, followed by hands-on laboratory and field experiences that reinforce classroom learning while exploring agricultural systems, environmental impacts, and related socioeconomic factors.

Agricultural Sciences at Cornell: A STEM-Focused Approach

Our Agricultural Sciences program delivers a STEM-based curriculum that integrates biology, chemistry, and data science with flexible, interdisciplinary training. Students develop scientific problem-solving skills to address critical challenges—from optimizing family farm operations to advancing careers in agricultural research, biotechnology, and sustainable systems engineering.

Positioned at the heart of the College of Agriculture and Life Sciences, the major leverages our public-private research university's cutting-edge laboratories and computational resources. Our program attracts academically diverse students, providing a strong scientific foundation while allowing specialization through focused electives that prepare graduates for careers requiring advanced technical expertise in modern agricultural and food systems.

Declaring the Major

- The major does not have any prerequisites for those matriculating as first-year students. However, general science coursework at the high school level, especially in biology and chemistry, will better prepare students for the life sciences coursework in this major.
- While there are no prerequisite courses before declaring the Agricultural Sciences major, transfer students should have one full academic year of Intro to Biology with labs, one College Writing/English Composition or Public Speaking course and one semester of Statistics. Transfer students who do meet these requirements should contact the undergraduate program coordinator to review possible pathways to the major.
- To discuss interests, goals, and requirements, prospective majors should contact the undergraduate major coordinator (agisci@cornell.edu).

Double Majors

Cornell students are not allowed to double major across colleges. Students are not allowed to continue their studies past their eighth (or equivalent) semester to complete additional majors or minors. Students

who pursue a second major must choose a major within the College of Agriculture and Life Sciences.

Agricultural Science students can double count a maximum of 12 credits between their two CALS majors. The introductory disciplinary courses (biology, chemistry, physics, and statistics) are allowed to be shared between programs and do not count towards the 12-credit maximum.

CALS students who fit one or more of the following conditions are ineligible to double major in Agricultural Sciences:

- Current junior or seniors
- Plant Sciences majors

If you do not qualify for the Agricultural Sciences double major, consider adding a SIPS minor, particularly Crop Management or Soil Science.

Minors

Agricultural Sciences majors are not allowed to double count courses used to satisfy major requirements towards completing a minor.

Facilities

World-Class Agricultural Learning Environment

As a college-wide interdisciplinary major, Agricultural Sciences leverages Cornell's exceptional diversity of agricultural facilities. Students gain hands-on experience through immersive field trips and laboratory sessions across our extensive campus resources.

In addition to Ithaca-based research facilities, students engage with cutting-edge research at Cornell AgriTech's 900-acre Geneva campus, where over 300 acres of research plots support breakthrough discoveries in crop production, protection, and food systems. They can work alongside faculty in the Animal Science Teaching and Research Center, with its dairy complex housing 700+ cattle, specialized equine facilities, and sheep and swine units across 2,300 acres of managed land.

These exceptional facilities provide Agricultural Sciences students with unparalleled opportunities for experiential learning in both traditional and emerging agricultural disciplines.

Program Information

- Instruction Mode: In Person
- Location: Ithaca, NY
- Minimum Credits for Degree: 120

Program Requirements

Agricultural Sciences Curriculum

First-year students take a required "Pathways to Success" course their first fall semester and must complete an agriculturally-related internship before senior year.

The major requires a minimum of 48 core course credits, with 15 to 25.5 credits for focused electives, depending on choice. Core and focused elective coursework must be taken for a letter grade unless S/U is the only option. No minimum grade is required for major requirements.

Students typically complete major requirements by junior year's end, allowing time for minors or study abroad. The program is transfer-friendly, with advisors helping both external and internal transfer students maximize course equivalency and maintain flexibility.

Required Coursework:

All courses that satisfy a requirement in the major must be taken for a letter grade unless S/U grading is the only option. Courses cannot be used to satisfy more than one requirement in the major.

The general college advanced placement credit policies apply, in addition to the

Agricultural Sciences specific policy below:

- AP credit in Biology may be used to fulfill the introductory biology requirement.
- AP credit in Chemistry may be used to fulfill the general chemistry requirement.
- AP credit in Physics may be used to fulfill the introductory physics requirement.
- An AP Statistics score of 5 may be used to fulfill the data literacy requirement.

Code	Title	Hours
PLSCI 1101	Plant Science and Systems	4
PLSCI 1110	Pathways to Success in Agriculture and Plant Sciences (Required only for fall-entry first-year students. This requirement is waived for transfer students.)	2
PLSCI 1900	Sustainable Agriculture: Food, Farming, and the Future	3
PLSCI 2110	Field Crop Systems	4
PLSCI 4440		4
PLSCI 2600	Soil Science	4

Introductory Courses:

Biology

Code	Title	Hours
Select two of the following: ¹		
BIOAP 1100	Domestic Animal Biology	
BIOEE 1610	Introductory Biology: Ecology and the Environment	
BIOEE 1780	An Introduction to Evolutionary Biology and Diversity	
BIOG 1140	Foundations of Biology	
BIOG 1440	Introductory Biology: Comparative Physiology	
BIOG 1445	Introduction to Comparative Anatomy and Physiology, Individualized Instruction	
BIOMG 1350	Introductory Biology: Cell and Developmental Biology	
PLSCI 1115	The Nature of Plants	
PLSCI 1130	Light and Life: The Relationship between Light and Life in the Natural World	
PLSCI 1420	Functional Plant Biology	
PLSCI 2400	Green World, Blue Planet	
PLSCI 2410	Introductory Plant Diversity and Evolution	
PLSCI 2470	Plants and Cultures around the World	

¹ Students should discuss biology options with their advisor depending on goals and interests, particularly those interested in research, graduate school, and pre-health studies.

Chemistry or Physics

Code	Title	Hours
Select one of the following: ¹		
CHEM 1560 & CHEM 1561	Introduction to General Chemistry and Introduction to General Chemistry Laboratory	
CHEM 2070 & CHEM 2071	General Chemistry I and General Chemistry I Laboratory	
PHYS 1101	General Physics I	
PHYS 1203	Physics of the Heavens and the Earth	

¹ Two semesters of chemistry, including organic chemistry, are recommended for students interested in research, graduate school, or pre-health studies.

Data Literacy

Code	Title	Hours
Select one of the following:		
AEM 2100	Introductory Statistics	
ENTOM 3030	Applied Statistics: Biological Experiments in Practice	
MATH 1710	Statistical Theory and Application in the Real World	
PLSCI 2200	Introduction to Mapping and Spatial Analysis with GIS	
STSCI 2100	Introductory Statistics and Data Science	
STSCI 2150	Introductory Statistics for Biology	

Food Systems

Code	Title	Hours
Select one of the following:		
AEM 2310	Business and Economics of Food	
FDSC 1200	Farm to Label	
FDSC 2000	Introduction to Physiochemical and Biological Aspects of Foods	
PLSCI 1300	Just Food: Exploring the Modern Food System	
PLSCI 2020	Foods of the Future	

Education / Extension

Code	Title	Hours
Select one of the following:		
COMM 2850	Communication, Environment, Science, and Health	
EDUC 2200	Introduction to Adult Learning	
EDUC 2210	Designing and Facilitating Learning for Development	
EDUC 2410	The Art of Teaching	
EDUC 3510	Engaged Learning through Extension, Outreach, and Instruction	
EDUC 4223	Community Learning Ecosystems: Place, SDGs & Hope	
ENTOM 3350	Naturalist Outreach Practicum	

Agribusiness

Code	Title	Hours
Select one of the following:		
AEM 1200	Introduction to Business Management	
AEM 2050	Introduction to Agricultural Finance	
AEM 3020	Farm Business Management	
AEM 3260	Cooperative Business Management	

Animal Science

Code	Title	Hours
Select one of the following:		
ANSC 2120	Animal Nutrition	
ANSC 2500	Dairy Cattle Principles	
ANSC 2650	Equine Biology and Management	
ANSC 3300	Fish Physiology	
ANSC 3500	Meat	
ANSC 3600	Beef Cattle Production	
ANSC 3800	Sheep	

International Agriculture

Code	Title	Hours
Select one of the following:		
ANSC 2550 & ANSC 2551 & ANSC 2552	Dairy Study Trip to Italy and Dairy Study Trip to Italy II and Dairy Study Trip to Italy III	
ANSC 3560 & ANSC 3561 & ANSC 3562	International Dairy Study Trip and International Dairy Study Trip II and International Dairy Study Trip III	
ANSC 4880	Global Food, Energy, and Water Nexus – Engage the US, China, and India for Sustainable Future	
GDEV 2300	Food Systems and Sustainable Development	
GDEV 4140	Global Cropping Systems and Sustainable Development	
GDEV 4450	Toward a Sustainable Global Food System: Food Policy for Developing Countries	

Focused Electives

Students will choose one of the four focus areas and complete all the requirements listed. Focused electives include:

- Animal Science
- Agribusiness
 - Business Management
 - Policy Analysis
- Sustainable Cropping Systems Management.
- Soil Health Management

Animal Science

Code	Title	Hours
Required Course		
ANSC 2210	Principles of Animal Genetics	4
List One		
Select two of the following:		
ANSC 2120	Animal Nutrition	8

ANSC 2400 & ANSC 2410	Biology of Reproduction and Biology of Reproduction Lab
ANSC 3540	Dairy Cattle Herd Health
ANSC 3550	Dairy Cattle Nutrition

List Two		
Select two of the following:		
ANSC 2500	Dairy Cattle Principles	6
ANSC 2650	Equine Biology and Management	
ANSC 3300	Fish Physiology	
ANSC 3500	Meat	
ANSC 3510	Dairy Herd Management	
ANSC 3600	Beef Cattle Production	
ANSC 3800	Sheep	

AgriBusiness

This area offers two tracks. Students may not mix and match between tracks.

Code	Title	Hours
Required Courses		
AEM 1200	Introduction to Business Management	3
ECON 1110	Introductory Microeconomics	3
AEM 2310	Business and Economics of Food	3

Track One: Business Management

Code	Title	Hours
Management		
Select one of the following:		
AEM 3020	Farm Business Management	
AEM 3260	Cooperative Business Management	
Marketing / Strategy		
Select one of the following:		
AEM 2480	Food and Consumer Packaged Goods Industry Dynamics	3
AEM 3270	Supply Chain Strategy and Supermarket Simulation	
AEM 3385	Social Entrepreneurship Practicum: Anabel's Grocery	
AEM 4420	Emerging Markets	

Finance

Select one of the following:		
AEM 2050	Introduction to Agricultural Finance	
AEM 4060	Risk Simulation and Monte Carlo Methods	
AEM 4210	Futures, Options and Financial Derivatives	

Track Two: Policy Analysis

Code	Title	Hours
Applied Economics		
Select one of the following:		
AEM 2300	International Trade and Finance	3
AEM 2310	Business and Economics of Food	
AEM 2350	Introduction To The Economics Of Development	
AEM 2500	Environmental and Resource Economics	
Policy Issues and Communication		
Select one of the following:		

AEM 2000	Contemporary Controversies in the Global Economy
AEM 2805	Strategic Responses to Poverty and Hunger in Developing Countries
AEM 3310	Introduction to Business Regulation
BSOC 3311	Environmental Governance
COMM 2200	Media Communication
PUBPOL 2040	Economics of the Public Sector

Policy Analysis

Select two of the following:

AEM 4350	Political Economy of the WTO
AEM 4450	Toward a Sustainable Global Food System: Food Policy for Developing Countries
NS 4480	Economics of Food and Malnutrition

Sustainable Cropping Systems Management

Code	Title	Hours
Required Course		
PLSCI 2250	Plant Genetics	4
PLSCI 2940	Introduction to Agricultural Machinery	2

Cropping Systems

Select two of the following:

PLSCI 3025	Hydroponic Food Crop Production and Management
PLSCI 3210	Soil and Crop Management for Sustainability
PLSCI 3350	Sustainable Orchard Management
PLSCI 4020	Plant Propagation
PLSCI 4030	Genetic Improvement of Crop Plants
PLSCI 4140	Global Cropping Systems and Sustainable Development
PLSCI 4175	Production and Management of Greenhouse Crops
PLSCI 4230	Equitable Crop Improvement: From Theory to Practice
PLSCI 4500	Fruit Crop Physiology
PLSCI 4520	Berry Crops: Culture and Management
PLSCI 4551	Principles of Nutrition and Nutrient Management in Crops and Landscape Plants
PLSCI 4730	Ecology of Agricultural Systems
NTRES 3250	Forest Management and Maple Syrup Production
VLEN 2400	Wines and Grapes: Composition and Analysis

Pest Management¹

Select two of the following:

ENTOM 3410	Applied Entomology
PLSCI 3010	Biology and Management of Plant Diseases
PLSCI 3150	Weed Biology and Management

Soil Science

Select one of the following:

ANSC 4120	Whole-Farm Nutrient Management
PLSCI 2200	Introduction to Mapping and Spatial Analysis with GIS
PLSCI 3210	Soil and Crop Management for Sustainability
PLSCI 4200	Geographic Information Systems (GIS): Concepts and Application
PLSCI 4660	Soil Ecology (may be taken with or without lab)

PLSCI 4720	Nutrient and Carbon Cycling and Management in Ecosystems
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Soil Health Management (minimum 15 credits required)

Code	Title	Hours
PLSCI 2200	Introduction to Mapping and Spatial Analysis with GIS	3
PLSCI 3210	Soil and Crop Management for Sustainability	3
PLSCI 3630	Soil Genesis, Classification, and Survey	4
PLSCI 3650	Environmental Chemistry: Soil, Air, and Water	3
ANSC 4120	Whole-Farm Nutrient Management	4
PLSCI 4200	Geographic Information Systems (GIS): Concepts and Application	3
PLSCI 4660	Soil Ecology (must be taken with lab)	4
PLSCI 4720	Nutrient and Carbon Cycling and Management in Ecosystems	3

Required Internship

Students gain practical experience through an agriculturally-related internship of at least six weeks of full-time effort that aligns with individual goals and complements formal coursework. The process involves a learning agreement and post-experience reflection, which is assessed in the required course, PLSCI 4900. Students are supported in career exploration, provided learning tools and resources to search for optimum internship experience. Abundant opportunities are available in every facet of agriculture and students are encouraged by their faculty advisor to approach their internship search with the same flexibility and creativity as with course planning. All students are encouraged to work closely with their faculty advisor to complement formal training and leverage the Ag Sciences major.

University Graduation Requirements Requirements for All Students

In order to receive a Cornell degree, a student must satisfy academic and non-academic requirements.

Academic Requirements

A student's college determines degree requirements such as residency, number of credits, distribution of credits, and grade averages. It is the student's responsibility to be aware of the specific major, degree, distribution, college, and graduation requirements for completing their chosen program of study. See the individual requirements listed by each college or school or contact the college registrar's office (<https://registrar.cornell.edu/service-resources/college-registrar-directory/>) for more information.

Non-academic Requirements

Conduct Matters. Students must satisfy any outstanding sanctions, penalties or remedies imposed or agreed to under the Student Code of Conduct (Code) or Policy 6.4. Where a formal complaint under the Code or Policy 6.4 is pending, the University will withhold awarding a degree otherwise earned until the adjudication process set forth in those procedures is complete, including the satisfaction of any sanctions, penalties or remedies imposed.

Financial Obligations. Outstanding financial obligations will not impact the awarding of a degree otherwise earned or a student's ability to access their official transcript. However, the University may withhold

issuing a diploma until any outstanding financial obligations owing to the University are satisfied.

Additional Requirements for Undergraduate Students

The University has two requirements for graduation that must be fulfilled by all undergraduate students: the swim requirement, and completion of two physical education courses. For additional information about fulfilling University Graduation Requirements, see the Physical Education website (<https://scl.cornell.edu/pe/>).

Physical Education

All incoming undergraduate students are required to take two credits (two courses) of Physical Education prior to graduation. It is recommended they complete the two courses during their first year at Cornell. Credit in Physical Education may be earned by participating in courses offered by the Department of Athletics and Physical Education (<https://catalog.cornell.edu/courses/pe/>) and Cornell Outdoor Education, by being a registered participant on a varsity athletic team, or performing in the marching band.

Students with medical concerns should contact the Office of Student Disability Services (<http://sds.cornell.edu/>).

Swim Requirement

The Faculty Advisory Committee on Athletics and Physical Education has established a basic swimming and water safety competency requirement for all undergraduate students. Normally, the requirement is taken during the Fall Orientation process at Helen Newman Hall or Teagle Hall pools. The requirement consists of the following: jump or step feet-first into the deep end of the pool, float or tread for one minute, turn around in a full circle, swim 25 yards using any stroke(s) of choice without touching the bottom or holding on to the sides (there is no time limit) and exit from the water. Students who do not complete the swim requirement during their first year, during a PE swim class or during orientation subsequent years, will have to pay a \$100 fee. Any student who cannot meet this requirement must register for PE 1100 Beginning Swimming as their physical education course before electives can be chosen.

If a student does not pass the swim requirement in their first Beginning Swimming PE class, then the student must take a second Beginning Swimming PE class (PE 1100 or PE 1101). Successful completion of two Beginning Swimming classes (based on attendance requirements) with the instructor's recommendation will fulfill the University's swim requirement.

Students unable to meet the swim requirement because of medical reasons should contact the Office of Student Disability Services (<http://sds.cornell.edu/>). When a waiver is granted by the Faculty Committee on Physical Education, an alternate requirement is imposed. The alternate requirement substitute is set by the Director of Physical Education.

CALS Graduation Requirements for the Bachelor of Science

Students are responsible for understanding and fulfilling all the requirements necessary for graduation. Additionally, students must promptly notify the college of any discrepancies or issues with their academic records.

CALS undergraduate students follow college distribution requirements corresponding to their matriculation/entry term and class standing.

Students matriculating/entering before Fall 2025 will complete the existing CALS distribution requirements. First-year students matriculating/entering Fall 2025 or later will be subject to the new CALS 2025+ distribution requirements. However, sophomore and junior transfer students matriculating/entering in Fall 2025 will follow the existing CALS distribution requirement to align with students in their corresponding cohort year. All students must adhere to the requirements designated for their matriculation/entry term and class standing. *There are no exceptions to this policy.*

Although specific requirements vary between the curriculums, all students must complete the following Graduation Requirements to earn the Bachelor of Science degree:

1. University Graduation Requirements
2. Credit Requirements
3. Distribution Requirements
4. Residency Requirement
5. GPA Requirement
6. Major Requirements
7. Application to Graduate

Credit Requirement Policies

1. Minimum total credits: 120 academic credits are required for graduation.
 - Important Exceptions:
 - Repeated Cornell courses that do not allow repeat for credit will not count towards the number of credits required for graduation. These credits do count toward the minimum twelve (12) credits required for full-time status and good academic standing.
 - Forbidden Overlaps will not count towards credits required for graduation. These credits do count toward the minimum twelve (12) credits required for full-time status and good academic standing. More information can be found under the Course Enrollment and Credits page.
 - Review or supplemental courses (e.g., 1000- to 1099-level) do not count towards the number of credits required for graduation. These credits do not count toward the minimum twelve (12) credits required for full-time status or good academic standing.
 - Physical Education courses do not count toward the required 120 credits for graduation. They also do not count toward the minimum twelve (12) credits required for full-time status or good academic standing.
2. Minimum Credits at Cornell: Sixty (60) academic credits must be completed at Cornell (includes Cornell in Rome, Capital Semester, and Brooks School Cornell in Washington DC Connect Program, and Shoals Marine Laboratory).
3. Maximum Non-Cornell Credits: Sixty (60) non-Cornell credits (AP, CASE, IB, GCE, French Baccalauréat, Cambridge Pre-University, and external transfer coursework) can be applied toward degree requirements. A student can transfer in a maximum of fifteen (15) academic credits earned before matriculation as a first-year student at any accredited college/university (AP, CASE, IB, GCE, French Baccalauréat, and external transfer credits). Refer to Non-Cornell (Transfer) Credit under Policies and Procedures for additional information.

4. All CALS students are required to fulfill a minimum number of CALS Credits, structured credits, and letter-graded credits. Specific policies are in the curriculum sections below.

Residency Requirements

- Eight (8) semesters of full-time study are expected. External transfer students are credited with one (1) semester in residence for each full-time semester (or equivalent) completed at another accredited institution prior to matriculation at Cornell.
- Internal transfer students must complete two (2) semesters in residence in CALS.
- The final semester before graduation must be completed in a Cornell program as a full-time student. Summer or winter semesters cannot be counted as a final semester. (The School of Continuing Education does not count towards a final semester in residency.)
- Students in the ninth (9th) (or equivalent) and final semester may be eligible to apply for prorated tuition. The eligibility criteria are listed online (<https://cals.cornell.edu/undergraduate-students/cals-student-services/degree-advising/cals-graduation-requirements-for-bachelor-of-science/>).
- The following programs are in residency: Cornell in Washington DC Connect Program (Fall or Spring only), Capital Semester, Shoals Summer Semester.

Grade Point Average (GPA) Requirements

Minimum cumulative GPA: 2.00 or above must be maintained. Students must earn a minimum cumulative GPA of 2.00 or better to graduate. The cumulative GPA includes all letter grades earned at Cornell.

CALS Degree Requirements Prior to 2025 (applies to Transfers entering Fall 2025)

These requirements apply to: First-year students who matriculated before Fall 2025, sophomore transfers who matriculate prior to Fall 2026, and junior transfers who matriculate before Fall 2027. All students must follow the requirements based on their matriculation and expected graduation dates. *There are no exceptions to this policy.*

Students are required to fulfill:

1. University Graduation Requirements:
 - a. Physical Education.
 - b. Swim Requirement.
2. Credit Requirements: 120 academic credits, of which a minimum of fifty-five (55) must be taken from the College of Agriculture and Life Sciences at Cornell. A minimum of one hundred (100) credits must be in courses for which a letter grade was received. PE and supplemental courses do not count as academic credit.
 - a. Fifty-five (55) CALS Credits are required for graduation. CALS Credits consist of courses offered within CALS and in Applied Economics and Management, Biological Sciences, Biology & Society, Earth and Atmospheric Sciences, Environment and Sustainability, Information Science, Nutritional Science, and the Department of Statistics and Data Science. CALS Credits include all courses with the following subjects: AGSCI, AIISP, ALS, AEM, ANSC, BEE, BIOG, BIOAP, BIOCB, BIOEE, BIOMG, BIOMI, BIOMS, BIONB, BIOSM, BSOC, BTRY, COMM, DSOC, EAS, EDUC, ENTOM, ENVS, FDSC, GDEV, IARD, INFO, LA, LEAD, NS, NTRES, PLBIO, PLBRG, PLHRT, PLPPM, PLSCI, PLSCS, STSCI, VIEN.
 - b. Minimum Letter-Graded Credits: One hundred (100) credits. Proration of letter-graded credits may be applicable to students that transfer non-Cornell credits (see Proration Chart for non-Cornell credit (<https://experience.cornell.edu/sites/default/files/resource-files/Proration%20Chart%20for%20Students%20with%20Non%20Cornell%20Credit.pdf>)).
3. Residency: Eight (8) semesters of full-time study are expected. External transfer students are credited with one (1) semester of residence for each full-time semester (or equivalent) completed at another accredited institution prior to matriculating at Cornell.
4. GPA: Students must earn a minimum cumulative GPA of 2.00 or better to graduate. The cumulative GPA includes all letter grades earned at Cornell.
5. Physical and Life Sciences: Eighteen (18) credits, of which six (6) credits must be Introductory Life Sciences/Biology and three (3) credits must be Chemistry or Physics.
6. Quantitative Literacy: Faculty legislation requires minimum competency in quantitative literacy. This requirement can be satisfied by taking an approved calculus or statistics class.
7. Social Science and Humanities: Students must complete four (4) courses within the seven (7) categories of Humanities and Social Sciences. The courses MUST span at least three (3) different categories. Human Diversity (D) is a required category. Humanities courses must be a minimum of three (3) credits.
8. Written and Oral Expression: Nine (9) credits total, of which at least six (6) must be in Written Expression. Oral Expression is not required by the college but may be required for some majors. If Oral Expression is not required by the major, all nine credits may be in Written Expression.
9. Major: See individual department listings for major requirements.
10. Application to Graduate: See Graduation Resources (<https://cals.cornell.edu/undergraduate-students/cals-student-services/graduation-resources/>).

Distribution Requirements

The purpose of the distribution requirement is to have all students achieve common learning outcomes. It is expected that through college and major course requirements graduates will be able to:

- Explain, evaluate, and effectively interpret factual claims, theories, and assumptions in the student's discipline(s) (especially in one or more of the college's priority areas of Food & Energy Systems, Social Sciences, Life Sciences, and Environmental Sciences) and more broadly in the sciences and humanities.
- Find, access, critically evaluate, and ethically use information.
- Integrate quantitative and qualitative information to reach defensible and creative conclusions.
- Communicate effectively through writing, speech, and visual information.
- Articulate the views of people with diverse perspectives.
- Demonstrate the capability to work both independently and in cooperation with others.

Through the study of Physical and Life Sciences, students develop their understanding and appreciation of the physical sciences, enhance their quantitative reasoning skills, and gain an appreciation of the variability of living organisms. Social Sciences and Humanities gives students perspective on the structure and values of the society in which we live and prepares them to make decisions on ethical issues that will affect their work and role in society. Written and Oral Expression is designed to help students become competent and confident in the use of oral and written communication to express themselves and their ideas.

Important Notes:

- Credits received for independent study, fieldwork, teaching, research, work experience, and internships cannot be used to fulfill the distribution requirements
- Review or supplemental courses, such as 1000- to 1099-level courses, will not be counted in the distribution areas.
- First-Year Writing Seminars (FWS) cannot be used to satisfy the Physical and Life Sciences distribution area.
- Courses that fulfill distributions are approved by the CALS Curriculum Committee. Distributions cannot be applied to a course retroactively, and individual student petitions for Cornell courses to fulfill distributions will not be accepted. Students may request a review of external transfer courses for fulfilling distribution requirements.

Physical and Life Sciences:

Eighteen (18) credits, of which six (6) credits must be Introductory Life Sciences/Biology and three (3) credits in Chemistry or Physics. Courses that count for Introductory Life Sciences/ Biology, Chemistry/Physics, Quantitative Literacy, and Other Physical and Life Sciences count towards the eighteen (18) credits for this requirement

Introductory Life Sciences/Biology Requirement (BIO-AG):

Students must complete at least six (6) academic credits of Introductory Life Sciences/Biology. Courses that count towards this requirement have the BIO-AG distribution attribute. Note: CALS does NOT accept BIO-AS for BIO-AG.

Offerings in the area provide a foundation in the field of biology. Courses must include: an evolutionary component, instruction on applying the process of science and a significant student-centered teaching component.

Chemistry/Physics (CHPH-AG):

Students must complete a minimum of three (3) credits of Chemistry or Physics. Includes all Cornell courses with the CHEM or PHYS prefix (excluding courses that are supplemental, independent study, research, TA, internship, and First-Year Writing Seminar). Courses that count towards this requirement have a CHPH-AG distribution attribute. Additionally, courses with the prefix CHEM or PHYS of at least 11xx numbering and a minimum of three (3) credits are accepted as fulfilling CHPH-AG.

Courses that meet the CALS Chemistry or Physics (CHPH) requirement provide students with a foundational understanding of key scientific principles. These courses delve into the study of chemistry (focusing on the composition, properties, and transformations of substances) or physics (exploring the principles of matter, energy, and their interactions). Fulfilling this requirement equips students with essential scientific knowledge that supports practical and innovative applications in fields like agriculture, environmental science, and food science, thereby fostering their ability to address and solve critical challenges within these domains.

Quantitative Literacy (MQL-AG):

Students must complete one (1) Quantitative Literacy course. Courses that count towards these requirements have an MQL-AG distribution attribute. Additionally, courses of at least 11xx numbering with the MATH prefix may fulfill this category. Calculus courses and Introductory Statistics courses may also fulfill MQL-AG.

Faculty legislation requires minimum competency in quantitative literacy. Courses that fulfill the Mathematics and Quantitative Literacy distribution in CALS enhance students' problem-solving skills by teaching them to understand abstract, logical relationships. These classes focus on the mathematical analysis of data, modeling natural and man-made systems, and developing algorithms critical for computation. Students will learn various quantitative methods and how to apply quantitative reasoning across different fields.

This requirement can also be satisfied by earning a score of four (4) or five (5) on the AP Calculus exam or a score of five (5) on the AP Statistics exam, or transfer of an approved calculus or statistics course with a minimum letter grade of "C" or better.

Other Physical Life Sciences (OPHLS-AG):

Other Physical Life Sciences courses count towards the eighteen (18) credit total for the Physical and Life Sciences requirement. Courses that count towards this requirement have the OPHLS-AG distribution attribute. The number of OPHLS-AG courses taken will vary by student. Courses with the following distributions are also accepted for the CALS OPHLS-AG distribution: PBS-HE, BIO-AS, PHS,AS, SDS-AS. Additionally, any course with BIO-AG, CHPH-AG or MQL-AG may alternatively fulfill OPHLS-AG.

Offerings in this area explore additional physical and life science subjects as well as quantitative literacy (math) courses. Courses satisfying this requirement help students understand and appreciate the physical sciences, enhance quantitative reasoning skills, or explore the variability of living organisms.

Social Sciences and Humanities:

Students must complete four (4) courses within the seven (7) categories of Humanities and Social Sciences. The courses MUST span at least three (3) different categories. Human Diversity (D) is a required category. Humanities courses must be a minimum of three (3) credits.

No more than two (2) courses in the same department will be counted toward the distribution requirement. Social Sciences & Humanities Categories:

(Also refer to Distribution Requirement Codes (<https://catalog.cornell.edu/general-information/distribution-codes/>))

Cultural Analysis (CA-AG)

These courses study human life in particular cultural contexts through interpretive analysis of individual behavior, discourse, and social practice. Topics include belief systems (science, medicine, religion), expressive arts and symbolic behavior (visual arts, performance, poetry, myth, narrative, ritual), identity (nationality, race, ethnicity, gender, sexuality), social groups and institutions (family, market, community), and power and politics (states, colonialism, inequality).

CALS also accepts courses of at least three (3) credits with the following distributions as fulfilling CA-AG: ALC-AS, ALC-HA, ALC-AAP, CA-HE, CA-AAP, GLC-AS

Foreign Language (FL-AG)

Foreign Language courses available for CALS students at Cornell are offered by several departments, including Africana Studies and

Research Center (AS&RC – language courses only), Asian Studies with languages such as Bangla-Bengali, Burmese, Chinese, Hindi, Indonesian, Japanese, Khmer, Korean, Sanskrit, Tagalog, Thai, and Vietnamese, and Classics (CLASS – language courses only). Additional offerings are provided by German Studies, which includes German, Dutch, and Swedish (language courses only), Linguistics (LING – language courses only), Near Eastern Studies (NES - language courses only), Romance Studies with languages like Catalan, French, Italian, Portuguese, Quechua, and Spanish, and Russian Studies, covering Russian, Hungarian, Polish, Serbian/Croatian, and Ukrainian. CALS will recognize these Foreign Language (FL) classifications by any college at Cornell, provided the class is taken for three (3) or more credits. Transfer students may have non-Cornell courses that meet SUNY World Languages requirements and are a minimum of three (3) credits reviewed as fulfilling FL-AG.

Human Diversity (D-AG)

These courses analyze historical or contemporary marginalized communities and the culturally specific contexts that produce unequal power relations in terms of race, nationality, ethnicity, indigeneity, sexuality, disability, religion, gender, or economic status.

Definition of “marginalize”: Any groups with reduced access to social status, political influence, economic advancement, educational advancement, healthcare, information, or any of the goods, services, and powers of a society can be considered “marginalized.” Causes of marginalization may be related to ethnic status, religion, country of origin, sexual orientation, geography, economics, and government policies. Those who exist on the furthest margins of a society are frequently subject to several of these forces.

CALS also accepts courses of at least three (3) credits with the following distributions as fulfilling D-AG: SCD-AS, SCD-HA, D-HE.

Non-equated external transfer courses will only be considered for junior transfer students who have taken an appropriate course at their prior institution and whose schedule does not allow space to take a Human Diversity (D-AG) course at Cornell. These situations will be reviewed individually after a required appointment with CALS Student Services.

Historical Analysis (HA-AG)

These courses interpret continuities and changes—political, social, economic, diplomatic, religious, intellectual, artistic, scientific—through time. The focus may be on groups of people, dominant or subordinate, a specific country or region, an event, a process, or a time period.

CALS also accepts courses of at least three (3) credits with the following distributions as fulfilling HA-AG: HA-AAP, HST-AAP, HST-AS, HST-HA, HA-HE

Knowledge, Cognition, and Moral Reasoning (KCM-AG)

These courses investigate the bases of human knowledge in its broadest sense, ranging from cognitive faculties shared by humans and animals such as perception, to abstract reasoning, to the ability to form and justify moral judgments. Courses investigating the sources, structure, and limits of cognition may use the methodologies of science, cognitive psychology, linguistics, or philosophy. Courses focusing on moral reasoning explore ways of reflecting on ethical questions that concern the nature of justice, the good life, or human values in general.

CALS also accepts courses of at least three (3) credits with the following distributions as fulfilling KCM-AG: ETM-AAP, ETM-AS, ETM-HA, KCM-AAP, KCM-HE

Literature and the Arts (LA-AG)

These courses explore literature and the arts in two different but related ways. Some courses focus on the critical study of artworks and on their history, aesthetics, and theory. These courses develop skills of reading, observing, and hearing and encourage reflection on such experiences; many investigate the interplay among individual achievement, artistic tradition, and historical context. Other courses are devoted to the production and performance of artworks (in creative writing, performing arts, and media such as film and video). These courses emphasize the interaction among technical mastery, cognitive knowledge, and creative imagination.

CALS also accepts courses of at least three (3) credits with the following distributions as fulfilling LA-AG, ALC-AS, ALC-HA, ALC-AAP, LA-AAP

Social and Behavioral Analysis (SBA-AG)

These courses examine human life in its social context through the use of social scientific methods, often including hypothesis testing, scientific sampling techniques, and statistical analysis. Topics studied range from the thoughts, feelings, beliefs, and attitudes of individuals to interpersonal relations between individuals (e.g., in friendship, love, conflict) to larger social organizations (e.g., the family, society, religious or educational or civic institutions, the economy, government) to the relationships and conflicts among groups or individuals (e.g., discrimination, inequality, prejudice, stigmas, conflict resolution).

CALS also accepts courses of at least three (3) credits with the following distributions as fulfilling SBA-AG: SSC-AS, SBA-HE, SBA-AAP, SSC-AAP

Written and Oral Expression:

Nine (9) credits total, of which at least six (6) must be in Written Expression. Oral Expression is not required by the college but may be required for some majors. If Oral Expression is not required by the major, all nine (9) credits may be in Written Expression. Writing in the Majors (WIM) courses do not count towards Written Expression.

Written Expression (WRT-AG)

All students are required to take at least six (6) credits of Written Expression and may take nine (9) credits to fulfill the Written and Oral Expression requirement. Courses that fulfill the Written Expression requirement in CALS focus on enhancing students' writing skills. Courses meeting this requirement devote at least 50% of class time to writing proficiency, involve at least five (5) writing assignments with detailed feedback, and emphasize revision and development. These courses ensure personalized attention and help students articulate ideas clearly, argue effectively, and engage with evidence critically. This structure supports students in improving both their writing mechanics and their ability to communicate persuasively across contexts.

CALS also accepts FWS courses as fulfilling WRT-AG. Transfer students may have courses that meet the SUNY Writing Requirement considered to fulfill this requirement.

Oral Expression (ORL-AG)

Students may take one (1) Oral Expression course towards the nine (9) required credits for Written and Oral Expression. Courses that fulfill the CALS Oral Expression requirement enhance students' public speaking and communication skills. Courses meeting this requirement center on improving oral proficiency, dedicating over 50% of class time to the principles of effective communication. Each course involves at least five (5) formal oral presentations, with four (4) undergoing detailed revisions based on structured feedback that focuses on speech organization, clarity, evidence use, and delivery. These courses offer personalized guidance and encourage students to apply feedback to subsequent

presentations. The aim is to refine students' abilities to articulate ideas persuasively and adapt messages for different contexts, ensuring they can communicate effectively on any topic.

CALS 2025+ Degree Requirements (applies to first-year students who start Fall 2025 or after)

The 2025+ CALS Curriculum applies to first-year students who enter CALS starting Fall 2025 and all semesters after. Transfer students entering Fall 2025 and all continuing students will follow the Prior to Fall 2025 Requirements. There are no exceptions to this policy.

All students are required to complete:

1. University Graduation Requirements
2. Credit Requirements
3. 120 Credits are required to graduate, of the 120:
 - A minimum seventy-five (75) must be CALS Credits (fifty-five (55) for transfer students).
 - A minimum of 105 must be structured academic credits (transfer courses can count towards this requirement).
 - A minimum of one hundred (100) letter-graded academic credits (transfer courses can count towards this requirement).
 - The following courses do not count towards the 120: PE course, courses numbered 1000-1099, forbidden overlap courses, and repeated courses (that do not allow repeats).
4. Residency Requirement
5. GPA Requirement
6. Distribution Requirements
7. E3 Learning Milestone
8. Major Requirements: See individual department listings for major requirements.
9. Application to Graduate: Information can be found on graduation webpage.

75 CALS Credits

Students are required to take seventy-five (75) CALS Credits. The following counts as CALS Credit:

- Any course with the following prefixes: AGSCI, AIIS, ALS, ANSC, BEE, BIOG, BIOAP, BIOCB, BIOEE, BIOMG, BIOMI, BIOMS, BIONB, BIOSM, BSOC, BTRY, COMM, EAS, EDUC, ENTOM, ENVS, FDSC, GDEV, INFO, LA, LEAD, NS, NTRES, PLSCI, STSCI, VIEN
- Courses with the FWS attribute (two (2) courses maximum)
- For BSBU students only: prefix AEM
 - AEM courses will not count towards the required seventy-five (75) CALS Credits, except for students who have officially been accepted to the AEM major. CALS students who choose to complete an AEM minor cannot count AEM courses towards their seventy-five (75) required CALS courses.

Students with matriculation status of Transfer will have a requirement of fifty-five (55) CALS Credits.

Distribution Requirements

The College of Agriculture and Life Sciences (CALS) college distribution requirements are the cornerstone of a diverse and comprehensive education.

These requirements encourage our students to venture beyond familiar subjects, develop a deeper understanding of others, uncover insights that

can spark new interests, and pave the way toward meaningful careers that can shape a just and sustainable future.

The CALS distribution requirements consist of:

- A minimum of thirty-nine (39) credit hours of coursework.
- A single course may not fulfill more than one college distribution requirement. However, a single course can simultaneously fulfill college and major requirements.
- Students in CALS have the option to take some of these courses either for a grade or using S/U grading. However, letter grades may be required for some majors.
- Non-academic credit courses (numbered 1000-1099 and PE) do not fulfill distribution requirements. Special Topics Courses (numbered 4940) do not fulfill distribution requirements.
- Courses that fulfill distributions are approved by the CALS Curriculum Committee. Distributions cannot be applied to a course retroactively, and individual student petitions for Cornell courses to fulfill distributions will not be accepted. Students may request a review of external transfer courses for fulfilling distribution requirements.

Students must complete all of the following:

Agriculture, Food Systems & Human Nutrition (AFS-AG)

- Take one (1) Agriculture, Food Systems & Human Nutrition (AFS-AG) course.

The Agriculture, Food Systems & Human Nutrition distribution requirement at CALS emphasizes a comprehensive understanding of the food system, including production, processing, distribution, consumption, and waste, with a focus on the integration of these multiple components. Students must learn to describe, analyze, and understand the interdependent nature and the environmental and nutritional impacts of the food system. To fulfill the requirement, a course must cover at least two components of the food system, analyze their interactions, and dedicate at least half of its content to this holistic view, potentially including topics like agricultural history, food sustainability, and nutrition access.

Biological Sciences (BSC-AG)

- Take one (1) Biological Sciences (BSC-AG) course. Note: the following are NOT accepted as fulfilling BSC-AG: BIO-AG, BIO-AS.

Courses that meet the Biological Sciences requirement for CALS dedicate most of their content (at least 75%) to exploring one or more of the following biological concepts: evolution, structure and function, the flow, exchange and storage of information, pathways and transformations of energy and matter, or living systems. These courses include an evolutionary component, teach students how to apply scientific methods, and include at least one of the following competencies: quantitative reasoning, modeling and simulation, interdisciplinary thinking, interdisciplinary collaboration and communication, or science and society relational understanding. Courses also emphasize student-centered learning activities such as labs, problem solving, case studies, research projects, or collaborative projects. Some courses within this distribution are identified as suitable for non-life sciences majors— these courses have no prerequisites and require only high school-level science knowledge.

Physical Sciences (PSC-AG)

- Take one (1) Physical Sciences (PSC-AG) course.

CALS Physical Sciences courses cover at least 75% of their content in fields such as chemistry, physics, earth science, atmospheric science, or astronomy, connecting theoretical knowledge to practical applications. Courses also emphasize student-centered learning activities such as labs, problem solving, case studies, research projects, or collaborative projects. Some courses within this distribution are identified as suitable for non-sciences majors - these courses have no prerequisites and require only high school-level science knowledge.

Sustainability Challenges (SCH-AG)

- Take one (1) Sustainability Challenges (SCH-AG) course.

Courses that satisfy the sustainability distribution requirement in CALS must allocate at least 30% of content or learning outcomes to examining the intricate interplay between economic, socio-political, and environmental aspects of sustainability issues or their solutions or to exploring the connections among three or more UN Sustainable Development Goals in relation to the main class topic. Additionally, the course must incorporate a learning outcome focused on one of three key proficiencies: systems thinking, decision-making amidst uncertainty, or understanding the factors that constrain sustainability, thereby ensuring students gain a comprehensive and interdisciplinary perspective on sustainability challenges.

Data Literacy (DLG-AG and DLS-AG)

Two required courses:

- Take one (1) course with attribute Data Literacy Statistics (DLS-AG).
- Take one (1) course with attribute Data Literacy General (DLG-AG) OR one (1) course with attribute Data Literacy Statistics (DLS-AG).

CALS courses fulfilling the Data Literacy General (DLG-AG) requirement are designed to teach students how to interpret and articulate insights from both quantitative and qualitative data, with an emphasis on various competencies such as data analysis, acquisition methods, curation, and security. Students will be expected to understand the types of data, their applications, and the ethical implications of data misuse upon completion of these courses. The courses must dedicate a significant portion of content to at least three (3) specific data literacy competencies and include at least one of these competencies as a main learning outcome.

Courses that fulfill Data Literacy Statistics (DLS-AG) additionally provide explicit instruction on mathematical approaches to collection, description, analysis, and inference of conclusions from quantitative data. Course content focuses on the Data Manipulating & Analysis competency: Ability to draw conclusions from data with quantitative and/or qualitative methods, which may include statistical or computational methods and may include tools like R, Python, Stata, Tableau, Unix, NVivo, QGIS, Excel, SPSS, etc.

Ethics (ETH-AG)

- Take one (1) course with attribute Ethics (ETH-AG). Note the following are NOT accepted as fulfilling ETH-AG: KCM-AG, ETM-AAP, ETM-AS, ETM-HA, KCM-AAP, KCM-HE.

Courses that fulfill the CALS Ethics requirement are designed to immerse students in the study of ethical principles impacting various facets of life, including personal, social, and global spheres, as well as in research and professional practices. These courses aim for students to critically engage with their values, understand diverse ethical perspectives, and articulate reasoned ethical positions. To satisfy the Ethics requirement, a course must devote over half of its content to ethical issues relevant to its main topic, incorporate historical or modern ethical debates, foster

personal ethical reflection, and include specific learning outcomes focused on ethics.

Human Diversity (D-AG)

- Take one (1) course with attribute Human Diversity (D-AG).

CALS Human Diversity courses foster a comprehensive understanding of the complexities surrounding historically or contemporarily marginalized communities, emphasizing the critical analysis of unequal power dynamics shaped by factors such as race, nationality, ethnicity, indigeneity, sexuality, disability, religion, gender, or economic status. To meet this requirement, a course must allocate at least 50% of its content to examining these issues, be a minimum of three (3) credits, and achieve specific learning outcomes. These outcomes include demonstrating knowledge of diverse cultural practices, understanding systemic oppression, and assessing personal cultural perspectives to identify potential biases.

CALS also accepts courses of at least three (3) credits with the following distributions as fulfilling D-AG: SCD-AS, SCD-HA, D-HE.

Non-equated external transfer courses will only be considered for junior transfer students who have taken an appropriate course at their prior institution and whose schedule does not allow space to take a Human Diversity (D-AG) course at Cornell. These situations will be reviewed individually after a required appointment with CALS Student Services.

Cultural, Social & Historical Understanding

Take two (2) courses of the below distributions, with a maximum of one (1) course in each category: CA-AG, FL-AG, HA-AG, LA-AG, SBA-AG.

Cultural Analysis (CA-AG)

These courses study human life in particular cultural contexts through interpretive analysis of individual behavior, discourse, and social practice. Topics include belief systems (science, medicine, religion), expressive arts and symbolic behavior (visual arts, performance, poetry, myth, narrative, ritual), identity (nationality, race, ethnicity, gender, sexuality), social groups and institutions (family, market, community), and power and politics (states, colonialism, inequality).

CALS also accepts courses of at least three (3) credits with the following distributions as fulfilling CA-AG: ALC-AS, ALC-HA, ALC-AAP, CA-HE, CA-AAP, GLC-AS.

Foreign Language (FL-AG)

Foreign Language - Foreign Language courses available for CALS students at Cornell are offered by several departments, including Africana Studies and Research Center (AS&RC – language courses only), Asian Studies with languages such as Bangla-Bengali, Burmese, Chinese, Hindi, Indonesian, Japanese, Khmer, Korean, Sanskrit, Tagalog, Thai, and Vietnamese, and Classics (CLASS – language courses only). Additional offerings are provided by German Studies, which includes German, Dutch, and Swedish (language courses only), Linguistics (LING – language courses only), Near Eastern Studies (NES - language courses only), Romance Studies with languages like Catalan, French, Italian, Portuguese, Quechua, and Spanish, and Russian Studies, covering Russian, Hungarian, Polish, Serbian/Croatian, and Ukrainian. CALS will recognize these Foreign Language (FL) classifications by any college at Cornell, provided the class is taken for three (3) or more credits. Transfer students may have non-Cornell courses that meet SUNY World Languages and are a minimum of three (3) credits reviewed as fulfilling FL-AG.

Historical Analysis (HA-AG)

These courses interpret continuities and changes - political, social, economic, diplomatic, religious, intellectual, artistic, scientific - through time. The focus may be on groups of people, dominant or subordinate, a specific country or region, an event, a process, or a time period.

CALS also accepts courses of at least three (3) credits with the following distributions as fulfilling HA-AG: HA-AAP, HST-AAP, HST-AS, HST-HA, HA-HE.

Literature and the Arts (LA-AG)

These courses explore literature and the arts in two different but related ways. Some courses focus on the critical study of artworks and on their history, aesthetics, and theory. These courses develop skills of reading, observing, and hearing and encourage reflection on such experiences; many investigate the interplay among individual achievement, artistic tradition, and historical context. Other courses are devoted to the production and performance of artworks (in creative writing, performing arts, and media such as film and video). These courses emphasize the interaction among technical mastery, cognitive knowledge, and creative imagination.

CALS also accepts courses of at least three (3) credits with the following distributions as fulfilling LA-AG: ALC-AS, ALC-HA, ALC-AAP, LA-AAP.

Social and Behavioral Analysis (SBA-AG)

These courses examine human life in its social context through the use of social scientific methods, often including hypothesis testing, scientific sampling techniques, and statistical analysis. Topics studied range from the thoughts, feelings, beliefs, and attitudes of individuals to interpersonal relations between individuals (e.g., in friendship, love, conflict) to larger social organizations (e.g., the family, society, religious or educational or civic institutions, the economy, government) to the relationships and conflicts among groups or individuals (e.g., discrimination, inequality, prejudice, stigmas, conflict resolution).

CALS also accepts courses of at least three (3) credits with the following distributions as fulfilling SBA-AG: SSC-AS, SBA-HE, SBA-AAP, SSC-AAP.

Written and Oral Expression

Nine (9) credits total, of which at least six (6) must be in Written Expression. Oral Expression is not required by the college but may be required for some majors. If Oral Expression is not required by the major, all nine (9) credits may be in Written Expression. Writing in the Majors (WIM) courses do not count towards Written Expression.

Written Expression (WRT-AG)

All students are required to take at least six (6) credits of Written Expression and may take nine (9) credits to fulfill the Written and Oral Expression requirement. Courses that fulfill the Written Expression requirement in CALS focus on enhancing students' writing skills. Courses meeting this requirement devote at least 50% of class time to writing proficiency, involve at least five (5) writing assignments with detailed feedback, and emphasize revision and development. These courses ensure personalized attention and help students articulate ideas clearly, argue effectively, and engage with evidence critically. This structure supports students in improving both their writing mechanics and their ability to communicate persuasively across contexts.

CALS also accepts FWS courses as fulfilling WRT-AG. Transfer students may have courses that meet the SUNY Writing Requirement considered to fulfill this requirement.

Oral Expression (ORL-AG)

Students may take one (1) Oral Expression course towards the nine (9) required credits for Written and Oral Expression. Courses that fulfill the CALS Oral Expression requirement enhance students' public speaking and communication skills. Courses meeting this requirement center on improving oral proficiency, dedicating over 50% of class time to the principles of effective communication. Each course involves at least five (5) formal oral presentations, with four (4) undergoing detailed revisions based on structured feedback that focuses on speech organization, clarity, evidence use, and delivery. These courses offer personalized guidance and encourage students to apply feedback to subsequent presentations. The aim is to refine students' abilities to articulate ideas persuasively and adapt messages for different contexts, ensuring they can communicate effectively on any topic.

Engaged, Experiential, Entrepreneurial (E3) Learning Milestone

The E3 Learning Milestone allows students to blend experiential learning with academics, apply theory to practice, and deepen their community and professional engagement. This milestone emphasizes learning through experience, engagement, and/or entrepreneurship, encouraging students to apply their academic knowledge in real-world settings in collaboration with diverse groups and community partners. By completing an E3-designated course or experience, students are able to link their classroom learning with practical application, understand how their experiences align with their academic goals at Cornell, and recognize their contributions to a broader community. Eligible E3 experiences include community-engaged courses, undergraduate research, internships, study-abroad programs, and more—each designed to foster these outcomes and enhance the student's role in their field and community.

Learning Outcomes

Upon completion of a course or experience that fulfills the E3 Learning Milestone requirement, students should be able to:

- Make connections between their disciplinary and scholarly learning and the practice or application of that knowledge.
- Explain how their course/experience contributes to and is informed by their learning goals at Cornell (i.e. in their major or course of study, as they define it).
- Explain how they engaged with and contributed to, or served, a community or cause greater than themselves.

The E3 Learning Milestone can be fulfilled by courses or non-course-based experiences. Courses cannot apply to another distribution requirement if used for E3.

The following courses are accepted as fulfilling E3:

- Any course with CU-CEL attribute.
- Any course with EEE-AG distribution.
- CALS E3 Research and Teaching courses with EEE-AG. With advisor approval some Independent Study (4970) and Internship academic components (4960) may fulfill this requirement.

Courses and experiences that fulfill the E3 Learning Milestone must meet the following requirements:

1. Involve practice and application of knowledge in a real context.
2. Provide learning outcomes at the outset of the course or experience, including but not limited to the learning outcomes articulated above.

3. Include an assignment or activity that promotes student reflection on their experience.

Learning Outcomes

Upon completion of the Agricultural Sciences major, students will be able to:

- Write and speak with clarity about complex agricultural issues, effectively communicate scientific findings, and critically analyze food system challenges using evidence-based reasoning.
- Apply interdisciplinary knowledge of plant and animal systems, demonstrating proficiency in both scientific principles and practical production methods.
- Exhibit specialized expertise in at least one agricultural discipline through concentrated study and application of advanced techniques in their chosen concentration.
- Create sustainable solutions for domestic and global agricultural challenges by integrating scientific knowledge, ethical considerations, and systems thinking to address real-world food production needs.