

# SUSTAINABLE AGRICULTURE & FOOD SYSTEMS, BACHELOR OF SCIENCE

## College of Agricultural & Environmental Sciences

Sustainable Agriculture & Food Systems is an interdisciplinary major hosted by the Department of Land, Air, & Water Resources (<http://lawr.ucdavis.edu>).

William Horwath, Ph.D., Lead Faculty Advisor

## Program Office

1150 PES; 530-752-1603; Sustainable Agriculture & Food Systems (<https://www.lawr.ucdavis.edu/students/undergrad-programs/sustainable-agriculture-and-food-systems/>)

## The Major Program

The Sustainable Agriculture & Food Systems (SA&FS) major serves students interested in improving the sustainability of agriculture and food systems. This major prepares graduates to understand the interdisciplinary and systems-based aspects of sustainability and provides them with the knowledge, leadership skills and experiences required to excel in agricultural and food systems professions.

## The Program

This program is designed to develop students' competencies for addressing the environmental, social, and economic challenges and opportunities associated with agricultural and food systems sustainability. The program emphasizes an experiential learning approach to sustainability education, allowing students to choose between three tracks within the major. Students in the Agriculture & Ecology track focus on crop and animal production systems, ecology, and practices that mitigate negative impacts while producing environmental and social benefits. Students in the Food & Society track focus on issues related to the social, cultural, political and community development aspects of agriculture and food systems. Students in the Economics & Policy track focus on issues related to agricultural and resource economics, policy and management. The program provides students with practical experiences through courses with on- and off-campus fieldwork and through internship placements at sites related to students' interests and focus of study.

## Lead Faculty Advisor

Lead Faculty Advisor & Track I Advisor. W. Horwath (Land, Air & Water Resources); Track II Advisor. R. Galt (Human Ecology); Track III Advisor. T. Tomich (Environmental Science & Policy).

**Advising Center** for the major is located in 1150 PES; 530-752-1603.

## Internships & Career Alternatives

Sustainable Agriculture & Food Systems students are required to complete an internship in the field before graduation. Internships have been arranged with local, county, & state agricultural agencies, production farms and commercial processors & retailers, domestic & international non-governmental organizations, and rural & urban community development programs. Graduates are prepared to pursue a broad range of careers related to agricultural production & food

system management, rural & urban community services, education & development, and agricultural & environmental sciences, as well as careers in agricultural, environmental, and economic policy & analysis. Positions may be in private industry, government and public service agencies and in the non-profit sector, nationally and internationally. The major also prepares students for graduate studies in a wide range of fields related to agriculture and food systems.

Code	Title	Units
<b>English Composition Requirement</b>		
See College requirement. ( <a href="https://caes.ucdavis.edu/students/advising/academic-planning/bachelors-degree-requirements/">https://caes.ucdavis.edu/students/advising/academic-planning/bachelors-degree-requirements/</a> )		4-8
(1) Either two courses emphasizing written expression or one course emphasizing written expression and one course emphasizing oral expression, with a grade of C- (or P) or better. The following UC Davis courses satisfy this requirement:		
One course from ENL 003; UWP 001, UWP 001Y, UWP 001V, UWP 048, UWP 049, UWP 101, UWP 101Y, UWP 101V, UWP 102 series, or UWP 104 series; AND one course selected from the courses not selected above, or from CMN 001; COM 001, COM 002, COM 003, COM 004, or NAS 005.		
(2) Advanced Placement English score of 4 of 5 PLUS any course listed in 1(a) or 1(b) above EXCEPT UWP 001 or ENL 003.		
(3) By successfully passing the English Composition Examination administered by the College of Letters & Science upon completion of 70 units of degree credit (the examination does not yield credit).		
Must include CMN 001.		
English Composition Requirement Subtotal		4-8
<b>Core Courses</b>		
<i>Plant Science</i>		
PLS 015	Introduction to Sustainable Agriculture	4
<i>Community &amp; Regional Development</i>		
CRD 020	Food Systems	4
ANS 112	Sustainable Animal Agriculture	3-4
or PLS 150	Sustainability & Agroecosystem Management	
<i>Agricultural &amp; Resource Economics</i>		
ARE 121	Economics of Agricultural Sustainability	4
<i>Plant Science</i>		
PLS 190	Seminar on Alternatives in Agriculture	2
<i>Environmental Science &amp; Policy</i>		
ESP 191A	Workshop on Food System Sustainability	3
ESP 191B	Workshop on Food System Sustainability	3
Core Courses Subtotal		23-24
<b>Internship Requirement</b>		
Students must complete at least 8 units of internship, which may be combined off-campus or on-campus units.		8
Internship Requirement Subtotal		8
<b>Applied Production</b>		
Choose one:		2-3
PLS 049	Organic Crop Production Practices	
PLP 040	Edible Mushroom Cultivation	
VEN 101A	Viticultural Practices	
VEN 101B	Viticultural Practices	
VEN 101C	Viticultural Practices	

ENH 120	Management of Container Media	
PLS 131	(Discontinued)	
<i>Animal Science</i>		
Choose one:		2
ANS 041L	Domestic Animal Production Laboratory	
ANS 049A	Animal Management Practices: Aquaculture	
ANS 049B	Animal Management Practices: Beef	
ANS 049C	Animal Management Practices: Dairy	
ANS 049D	Animal Management Practices: Goats	
ANS 049E	Animal Management Practices: Horses	
ANS 049F	Animal Management Practices: Laboratory Animals	
ANS 049G	Animal Management Practices: Meats	
ANS 049H	Animal Management Practices: Poultry	
ANS 049I	Animal Management Practices: Sheep	
ANS 049J	Animal Management Practices: Swine	
Choose one:		2-3
ABT 049	Field Equipment Operation	
ABT 052	Field Equipment Welding	
ABT 101	Engine Technology	
ABT/IAD 142	Equipment & Technology for Small Farms	
FST 050	Introduction to Food Preservation	
Applied Production Subtotal		6-8
<b>Tracks</b>		
Choose one track:		94-110
Track I: Agriculture & Ecology (p. 2)		
Track II: Food & Society (p. 3)		
Track III: Economics & Policy (p. 4)		
Tracks Subtotal		94-110
<b>Total Units</b>		<b>135-158</b>

## Track I: Agriculture & Ecology

Focuses on crop and animal production systems, ecology, and practices that mitigate negative impacts while producing environmental and social benefits.

Code	Title	Units
<b>Preparatory Subject Matter</b>		
<i>Mathematics</i>		
MAT 016A	Short Calculus	3
MAT 016B	Short Calculus	3
PLS 120	Applied Statistics in Agricultural Sciences	4
or STA 100	Applied Statistics for Biological Sciences	
<i>Chemistry</i>		
CHE 002A	General Chemistry	5
CHE 002B	General Chemistry	5
<i>Physics</i>		
PHY 001A	Principles of Physics	3
<i>Biological Science</i>		
BIS 002B	Introduction to Biology: Principles of Ecology & Evolution	5

BIS 002C	Introduction to Biology: Biodiversity & the Tree of Life	5
<i>Plant Science</i>		
VEN 002	Introduction to Viticulture	2
<i>Animal Science</i>		
ANS 001	Domestic Animals & People	4
or ANS 002	Introductory Animal Science	
<i>Food Science &amp; Technology</i>		
FST 001	Principles of Food Science	3
<i>Economics</i>		
ECN 001A	Principles of Microeconomics	4
or ECN 001AV	Principles of Microeconomics	
or ECN 001AY	Principles of Microeconomics	
<i>Community &amp; Regional Development</i>		
CRD 001	The Community	4
<i>Philosophy</i>		
Choose one:		4
PHI 014	Ethical & Social Problems in Contemporary Society	
PHI 015	Introduction to Bioethics	
PHI 024	Introduction to Ethics	
Choose one:		4-5
ANT 002	Cultural Anthropology	
POL 001	American National Government	
or POL 001Y	American National Government	
POL 004	Basic Concepts in Political Theory	
SOC 001	Introduction to Sociology	
SOC 003	Social Problems	
Preparatory Subject Matter Subtotal		58-59
<b>Depth Subject Matter</b>		
<i>Agricultural &amp; Resource Economics</i>		
Choose one:		3-4
ARE 112	Fundamentals of Organization Management	
ARE 120	Agricultural Policy	
ARE 145	Farm & Rural Resources Appraisal	
ARE 147	Resource & Environment Policy Analysis	
ARE 150	Agricultural Labor	
<i>Environmental Science &amp; Policy</i>		
Choose one:		3-4
ESP 161	Environmental Law	
ESP 169	Water Policy & Politics	
HYD 150	Water Law	
<i>Soil Science</i>		
SSC 100	Principles of Soil Science	4-5
or SSC 109	Sustainable Nutrient Management	
Choose two:		6-8
ENT 119	Apiculture	
HYD/ESM/ABT 110	Irrigation Systems & Water Management	
PLS 105	Concepts in Pest Management	
PLS 111	Principles of Agronomic Crop Production Systems	

PLS 112	Forage Crop Production	
PLS 113	Biological Applications in Fruit Tree Management	
PLS/IAD 160	Agroforestry: Global & Local Perspectives	
PLS 171	Principles & Practices of Plant Propagation	
SSC 111	Soil Microbiology	
SSC 112	Soil Ecology	
Additional upper division restricted electives chosen in consultation with the track faculty advisor.		20
Depth Subject Matter Subtotal		36-41
<b>Total Units</b>		<b>94-100</b>

## Track II: Food & Society

Focuses on issues related to the social, cultural, political and community development aspects of agriculture and food systems.

Code	Title	Units
<b>Preparatory Subject Matter</b>		
<i>Philosophy</i>		
PHI 005	Critical Reasoning	4
or PHI 031	Appraising Scientific Reasoning	
Choose one:		4
PHI 014	Ethical & Social Problems in Contemporary Society	
PHI 015	Introduction to Bioethics	
PHI 024	Introduction to Ethics	
<i>Statistics</i>		
STA 013	Elementary Statistics	4
or STA 013Y	Elementary Statistics	
Choose at least one:		4-5
CRD 151	Community Field Research: Theory & Analysis	
LDA/ABT 150	Introduction to Geographic Information Systems	
STA 103	Applied Statistics for Business & Economics	
SOC 106	Intermediate Social Statistics	
<i>Chemistry</i>		
CHE 002A	General Chemistry	5
<i>Biological Science</i>		
BIS 002A	Introduction to Biology: Essentials of Life on Earth	4-5
or BIS 010	Everyday Biology	
<i>Plant Science</i>		
PLS 002	Botany & Physiology of Cultivated Plants	4
Choose one:		3-5
BIS 002B	Introduction to Biology: Principles of Ecology & Evolution	
ESP 001	Environmental Analysis	
WFC 010	Wildlife Ecology & Conservation	
<i>Food Science &amp; Technology</i>		
FST 001	Principles of Food Science	3
<i>Soil Science</i>		
SSC 010	Soils in Our Environment	3

### Economics

ECN 001A	Principles of Microeconomics	4
or ECN 001AV	Principles of Microeconomics	
or ECN 001AY	Principles of Microeconomics	

### Political Science

POL 001	American National Government	4
or POL 001Y	American National Government	
or POL 004	Basic Concepts in Political Theory	

Choose one: 4-5

ANT 002	Cultural Anthropology	
SOC 001	Introduction to Sociology	
SOC 003	Social Problems	

### Community & Regional Development

CRD 001	The Community	4
CRD 002	(Discontinued)	4

Preparatory Subject Matter Subtotal 58-63

### Depth Subject Matter

#### Agricultural & Resource Economics

Choose one: 4-5

ARE 112	Fundamentals of Organization Management	
ARE 145	Farm & Rural Resources Appraisal	
ARE 147	Resource & Environment Policy Analysis	
ARE 150	Agricultural Labor	

Choose one: 3-4

ARE 176	Environmental Economics	
ESP 160	The Policy Process	
ESP 161	Environmental Law	
ESP 169	Water Policy & Politics	
ESP 172	Public Lands Management	
ESP 179	Environmental Impact Assessment	

Choose 12 units: 12

ANT/ESP 101	Ecology, Nature, & Society	
CRD 118	Technology & Society	
CRD 142	Rural Change in the Industrialized World	
CRD 149	Community Development Perspectives on Environmental Justice	

CRD 152	Community Development	
SOC 130	Race Relations	
SOC 160	Sociology of the Environment	

Choose one: 4

AMS 101G	Special Topics: New Directions in American Culture Studies	
AMS 156	Race, Culture & Society in the United States	
HIS 108	Global Environmental History	
HIS 172	American Environmental History	
NAS 123	Native Foods & Farming of the Americas	
NAS 162	California Indian Environmental Policy II	
PHI 109	Philosophy of the Social Sciences	
WMS 104	Feminist Research	
WMS 136	Critical Food Studies	

Additional upper division restricted electives chosen in consultation with the track faculty advisor. 20

Depth Subject Matter Subtotal	43-45
<b>Total Units</b>	<b>101-108</b>

## Track III: Economics & Policy

Focuses on issues related to agricultural and resource economics, policy and management.

Code	Title	Units
<b>Preparatory Subject Matter</b>		
<i>Mathematics</i>		
MAT 016A	Short Calculus	3
MAT 016B	Short Calculus	3
STA 013	Elementary Statistics	4
or STA 013Y	Elementary Statistics	
Choose one:		4
ARE 106	Econometric Theory & Applications	
STA 103	Applied Statistics for Business & Economics	
SOC 106	Intermediate Social Statistics	
<i>Chemistry</i>		
CHE 002A	General Chemistry	5
<i>Biological Science</i>		
BIS 002A	Introduction to Biology: Essentials of Life on Earth	4-5
or BIS 010	Everyday Biology	
<i>Plant Science</i>		
PLS 002	Botany & Physiology of Cultivated Plants	4
Choose one:		3-5
BIS 002B	Introduction to Biology: Principles of Ecology & Evolution	
ESP 001	Environmental Analysis	
WFC 010	Wildlife Ecology & Conservation	
<i>Food Science &amp; Technology</i>		
FST 001	Principles of Food Science	3
<i>Soil Science</i>		
SSC 010	Soils in Our Environment	3
<i>Economics</i>		
ECN 100A	Intermediate Micro Theory: Consumer & Producer Theory	4
ECN 100B	Intermediate Micro Theory: Imperfect Competition & Market Failure	4
<i>Political Science</i>		
POL 001	American National Government	4
or POL 001Y	American National Government	
or POL 004	Basic Concepts in Political Theory	
Choose one:		4-5
ANT 002	Cultural Anthropology	
SOC 001	Introduction to Sociology	
SOC 003	Social Problems	
<i>Community &amp; Regional Development</i>		
CRD 001	The Community	4
<i>Philosophy</i>		
Choose one:		4

PHI 014	Ethical & Social Problems in Contemporary Society	
PHI 015	Introduction to Bioethics	
PHI 024	Introduction to Ethics	
Preparatory Subject Matter Subtotal		60-64
<b>Depth Subject Matter</b>		
<i>Agricultural &amp; Resource Economics</i>		
Choose one:		3-4
ARE 112	Fundamentals of Organization Management	
ARE 145	Farm & Rural Resources Appraisal	
ARE 150	Agricultural Labor	
ARE 157	Analysis for Operations & Production Management	
Choose 11-12 units:		11-12
ARE 120	Agricultural Policy	
ARE 130	Agricultural Markets	
ARE 147	Resource & Environment Policy Analysis	
ARE 176	Environmental Economics	
ESP 160	The Policy Process	
ESP 161	Environmental Law	
ESP 169	Water Policy & Politics	
ESP 172	Public Lands Management	
ESP 179	Environmental Impact Assessment	
Choose 8 units:		8
ANT 101	Ecology, Nature, & Society	
CRD 118	Technology & Society	
CRD 142	Rural Change in the Industrialized World	
CRD 149	Community Development Perspectives on Environmental Justice	
CRD 152	Community Development	
SOC 130	Race Relations	
SOC 160	Sociology of the Environment	
Additional restricted electives chosen in consultation with an advisor.		20
Depth Subject Matter Subtotal		42-44
<b>Total Units</b>		<b>102-108</b>