# Student Learning Outcomes and Curriculum Map

## Sustainable Agriculture and Food Systems, BS


### SPECIALIZATIONS or OPTIONS

<table>
<thead>
<tr>
<th>Program Student Learning Outcomes:</th>
<th>CORE COURSES (A)</th>
<th>FOOD PRODUCTION (B1)</th>
<th>NUTRITION &amp; FOOD (B2)</th>
<th>FOOD &amp; SOCIETY (B3)</th>
<th>CAP-STONE (D)</th>
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<tbody>
<tr>
<td>1. <strong>Appraise</strong> the integrated nature of agricultural &amp; food syst.</td>
<td>COM108, AVS132, HSS130, APG208, NFS210, EEC105</td>
<td>PRODUCTION: 2 FROM AFS101/102, AFS120/121, AVS101/102, NFS150, PL225</td>
<td>NUTRITION &amp; FOOD (B2):</td>
<td>FOOD &amp; SOCIETY (B3):</td>
<td>INTERNSHIP or SPECIAL PROJECT:</td>
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<td>2. <strong>Explain</strong> the scientific basis and interdisciplinary approaches used in the study of SAFS</td>
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<td>3. <strong>Examine</strong> the dynamics of diversity, equity, access, and security in relation to elements in the food syst.</td>
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<td>4. <strong>Evaluate</strong> which management practices are used in the sustainable production of food at scales from local to global</td>
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<td>5. <strong>Evaluate</strong> the role of sustainable agricultural and food systems in producing healthy food that is equitable &amp; accessible to all.</td>
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<td>6. <strong>Evaluate</strong> the interrelatedness between sustainable agriculture and food systems and culture, welfare, economy, and policy from the local to the global scales</td>
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<td>7. <strong>Create</strong> local &amp; global solutions to a wide variety of complex challenges related to sustainable agricultural and food systems using interdisciplinary approaches &amp; teams</td>
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**Map Key**

I = Outcome Introduced
R = Outcome Reinforced
E = Outcome Emphasized for Mastery
Learning goals:

Students will (learning goal in bold, outcomes embedded within learning goals):

1. **Understand the complexity of the biological, cultural, social, economic, and political issues involving the sustainable harvesting, production, processing, marketing, and use of food (systems-thinking).**
   1.1. Appraise the integrated nature of agricultural and food systems.
   1.2. Explain the scientific basis and interdisciplinary approaches used in the study of sustainable agricultural and food systems.

2. **Contextualize the important role of food in our cultures and societies, from the local to the global scales.**
   2.1. Examine the dynamics of diversity, equity, access, and security in relation to elements in the food systems.
   2.2. Discuss the different ways in which food is produced and used in different cultures.

3. **Acquire depth of knowledge (skills and competency) in their chosen field of expertise (food production, nutrition and food, food and society) needed to address the challenges involved in the sustainable harvesting, production, processing, marketing, and use of food.**
   3.1. Evaluate which management practices are used in the sustainable harvesting and production of food at scales from local to global (food production option)
   3.2. Evaluate the role of sustainable agricultural and food systems in providing healthy food that is equitable accessible to all (food and nutrition option).
   3.3. Evaluate the interrelatedness between sustainable agriculture and food systems and culture, welfare, economy, and policy from the local to the global scales (food and society option)

4. **Be able to work in interdisciplinary teams to provide solutions to the complex challenges facing the sustainable harvesting, production, processing, marketing, and use of food.**
   4.1. Create local and global solutions to a wide variety of complex challenges related to sustainable agricultural and food systems using interdisciplinary approaches and teams
Student Learning Outcomes and Curriculum Map
Sustainable Agriculture and Food Systems, BS


Course descriptions (*General Education course; ** previous temporary courses proposed as permanent)

A1. Core courses (Goal: Provide basic foundation in SAFS with an interdisciplinary focus) (18 credits)

- URI 101 Planning for Academic Success
- COM 108* Spaceship Earth
- AVS 132* Animal Agriculture, Food Policy, and Society
- HSS 130* The Problem of Hunger in the US
- NFS 210* Applied General Nutrition
- EEC 105* Introduction to Resource Economics
- APG 308* Sustainable Agriculture and Food Options (previously APG 301)

A.2 BASIC SCIENCES (12 credits): ** Required: BIO 101/103 (4 cr), BIO 102/104 (4 cr), either CHM101/102 or CHM103/105 (4 cr) (highly recommended BIO262 and one Statistics course)

B. Specialization courses (Goal: Provide depth of knowledge in specialization area while maintaining interdisciplinary breadth in SAFS)

B.1. Sustainable Agriculture Option (Natural sciences – From elements to ecosystems)

Students in this option will specialize in the production of plants and animals for human uses. They will understand the integrated components of agriculture systems (soils, microbes, plants, animals), and the impacts of agriculture on the environment. They should be able to apply principles of microbiology, biology, physiology, pathology, and ecology to the sustainable production and management of agricultural species. Consistent with the focus on coastal agriculture and food harvesting, students may choose to specialize in either plant or animal (aquatic or terrestrial) agricultural systems.

Introduction to Agricultural Production: Choose 2 from

- AFS 102/104 Introduction to Aquaculture
- AFS 120/121 Introduction to Fisheries
- AVS 101/102* Introduction to Animal Science
- PLS 150* Plants, People, and the Planet
- PLS 255 Horticultural Plant Science

Management: Choose two from:

- AFS 201/202 Finfish/Shellfish Aquaculture
- AFS 321/323 World Fishing Methods, Lecture and Laboratory
- AVS 104 Animal Management Techniques or AVS 323/324 – Animal Management I, II
- PLS 324/325 Vegetable Crops and Vegetable Crops Production Technologies
- PLS 311 Fruit Culture

Environment: Choose two from:

- NRS 212 Intro to Soil Science
- AVS/PLS 275** Pasture and Grazing Management in Sustainable Agriculture
- CHE 212 Chemical Process Calculations

B.2. Nutrition & Food Option (Natural sciences – Healthy foods, healthy ecosystems, and healthy humans)

Students in this option will learn the basic principles of food science and nutrition.

- NFS 212 Public Health Nutrition
- NFS/MIC 245 Food Safety
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**Sustainable Agriculture and Food Systems, BS**


NFS 336  Scientific Principles of Food I
NFS 337  Scientific Principles of Food II
NFS 375  Foodservice Management I
NFS 376  Foodservice Management II

**B 3. Food & Society Option (Social sciences – From local to global)**

Students in this option will specialize in the social, political, economic, and marketing aspects of food production.

*Policy:*
- MAF 100*  Human Use and Management of the Marine Environment
- APG/MAF 413  Peoples of the sea

*Food, Culture, and Equity: Choose 2 from:*
- APG 203*  Cultural Anthropology
- APG/SOC 329  Contemporary Mexican society
- APG/SOC 415  Migration in the Americas

*Economics: Choose 2 from:*
- EEC 205  Resource Management and Conservation
- EEC 310  Economics for Environmental Resource Management and Policy
- EEC 350  Sustainable Energy Economics and Policy
- EEC 355  The Economics of Climate Change

**C. Capstone Experience (Experiential learning in interdisciplinary teams, Internships and International Experience)**

These courses will be required for all students (concentration). Students will perform 7 credits of internship/special projects/studio and 6 credits of two core courses that will guide students through an interdisciplinary problem-based project in sustainable agriculture and food systems.

*Core Courses (6 credits):*
- NRS 300*  Introduction to Global Issues in Sustainable Development
- AVS/NFS 504  Food Systems, Sustainability and Health

*Internships and Experiential Learning courses (7 credits):*
- LAR 444 (4 cr.)  Landscape Architecture Studio III: Sustainable Design (*Interdisciplinary teams of students and faculty working on a project related to challenges in sustainable agriculture and food systems, 4 credits*)

*AND choose 1 other course from:*
- APG/SOC329 and SOC497 (3 options)
  - Environment and Society in Oaxaca, Mexico (I-term) (I)
  - Sustainable Communities and Food Cultures in Naples, Italy (summer) (I)
  - Research and Service Learning in Oaxaca, Mexico (summer) (I)

*AFS 391/392; AFS/AVS/PLS 491/492; NFS491  Special Projects*
*AVS/PLS 399; NFS451  Internships*
LIST OF SUPPORTING ELECTIVES  (Note: This list does not include the core or concentration courses, which are included above; in bold: recommended courses)

AAF  201 Introduction to Africana Studies
AAF  240 Race and Ethnic Relations
AAF  290 African-American Women: Service, Community, and Self
AAF  300 The History, Politics, and Culture of Cape Verde
AAF  336 Social Inequality
AAF 390 Directed Study/Topics in Film Media Production
AAF  410 Issues in African Development
AAF  415 Dynamics of Social Change in the Caribbean
AAF  466 Urban Problems
AAF  498 Senior Seminar in African and Afro-American Studies
AFS  190 Issues in Biotechnology
AFS  210 Introduction to the Marine Environment
AFS  211 Introduction to the Marine Environment Laboratory
AFS  315 Living Aquatic Resources
AFS  316 Living Aquatic Resources Laboratory
AFS  321 World Fishing Methods
AFS  322 Laboratory for World Fishing Methods
AFS  362 Crustacean Aquaculture
AFS  415 Fishery Science
AFS  416 Fishery Science Laboratory
AFS  425 Aquaculture and the Environment
AFS  481 Shellfish Aquaculture Laboratory
AFS  483 Salmonid Aquaculture
AFS  486 Fish Physiology
AFS  500 Diseases of Aquatic Organisms
AFS  531 Fisheries Stock Assessment
AFS  584 Advanced Aquaculture Systems
APG  200 Language and Culture
APG  302 Methods of Anthropological Inquiry
APG  315 Cultures and Societies of Latin America
APG  463 Seminar in Cultural Heritage
APG  470 Problems in Anthropology
AVS  322 Animal Diseases
AVS  331 Anatomy and Physiology
AVS  333 Anatomy and Physiology Laboratory
AVS  412 Animal Nutrition
AVS  420 Animal Breeding and Genetics
AVS  472 Physiology of Reproduction
AVS  473 Physiology of Reproduction Laboratory
BCH  211 Biochemical Aspects of Nutrition and Physiology
BCH  311 Introductory Biochemistry
BCH  321 Plant Diversity
BCH  323 Field Botany and Taxonomy
BCH  346 Plant Physiology
BCH  348 Plant Physiology Laboratory
BCH  366 Vertebrate Biology
BCH  441 Environmental Physiology of Animals
BPS  203 Herbal Medicines and Functional Food
BUS  365 Marketing Principles
BUS  460 Global Supply Chain Management
CPL  202 Introductory Urban Geography: Understanding Cities
CPL  391 Directed Study in Community Planning
CPL  410 Fundamentals of Community Planning Practice
CPL  485 Environmental Planning
CPL  498 Community Planning Seminar
CVE  374 Environmental Engineering
CVE  375 Environmental Engineering Laboratory
CVE  474 Water Quality Sampling And Analysis
CVE  475 Water in the Environment
CVE  477 Environmental Sustainability and Green Engineering
EEC  440 Benefit-Cost Analysis
EEC  441 Markets, Trade, and Natural Resources
ENT  385 Introductory Entomology
ENT  387 Economic Entomology
ENT  411 Pesticides and the Environment
GEO  305 Global Climate Change
GEO  482 Innovative Subsurface Remediation Technologies
GEO  483 Hydrogeology
GWS  150 Introduction to Gender and Women's Studies
HIS  117 History of Medicine
HIS  346 Immigration, Ethnicity, and Race in America
ITL  315 Italian Cinema
LAR  201 Survey of Landscape Architecture
LAR  434 Introduction to Environmental Law
MAF  220 Introduction to Marine and Coastal Law
MAF  330 World Fishing
MAF  523 Fisheries Law and Management
MAF  582 Coastal Ecosystem Governance
NFS  276 Food, Nutrition, and People
NFS  431 Chemistry of Food and Nutraceuticals
NRS  411 Population and Environmental Change
NRS  412 Soil-Water Chemistry
NRS  414 Climate Change Science and Policy
NRS  426 Soil Microbiology
NRS  450 Soil Conservation and Land Use
NRS  461 (361) Watershed Hydrology and Management
PSC  403 Global Ecopolitics
SOC  300 Topics In Sociology
SOC  336 Social Inequality