

AGRICULTURE AND FOOD SYSTEMS (AFS)

The agriculture and food systems program offers a flexible curriculum to students seeking integrated knowledge and experiences in modern agricultural and food systems to prepare for varied careers in these fields.

Students in this program will obtain knowledge in a variety of topics including agricultural practices, the science and management of working landscapes, locally produced foods, value-added agricultural products, and the promotion of healthy eating through sustainable food production and food policies. Our graduates will be prepared to pursue careers in a wide range of fields including the production of food, fiber, and agricultural services; management and marketing of agricultural operations; management of working lands, landscapes and ecosystems; agriculture/food/nutrition/natural resources-related research; policy-making; and other current and emerging professions.

The program offers both a bachelor of science (B.S.) degree and a bachelor of arts (B.A.) degree. The B.A. degree offers more flexibility to take courses from a variety of disciplines or pursuing a dual degree, second major, or minor. The B.S. degree best serves those seeking a strong foundation in scientific and technical knowledge and/or who envision pursuing an advanced degree.

<https://colsa.unh.edu/agriculture-nutrition-food-systems>

Programs

- [Agriculture and Food Systems Major \(B.A.\)](#)
- [Agriculture and Food Systems Major \(B.S.\)](#)
- [Agriculture and Food Systems Minor](#)
- [Brewing Minor](#)
- [Horticulture Minor](#)

Courses

Sustainable Agriculture and Food Systems (SAFS)

SAFS 403 - Green Thumb Workshop

Credits: 2

The objective of this course is to instill a life-long appreciation for garden plants and the many aesthetic, therapeutic, and culinary roles they play in enhancing our lives and landscapes. This course emphasizes hands-on learning of key horticultural skills and techniques (e.g. garden design, propagation, pruning, plant breeding, and problem diagnosis), complemented by activities designed to bring the beauty and utility of plants to life (e.g. flower arranging, botanical drawing, dyeing, and tastings).

Grade Mode: Letter Grading

Special Fee: Yes

SAFS 405 - Sustainable Agriculture and Food Production

Credits: 4

This course introduces the fundamental concepts that define sustainable and organic agriculture. We will explore the scientific and biological principles that underlie sustainable and organic farming techniques and methods, and each student will explore research-based evidence surrounding the sustainability of different practices within the agricultural and food system. We will study the environmental, social and economic impacts of different food production systems, with an emphasis on systems common in the U.S. Finally, we will look at the role each of us has in influencing how food is grown, either as producer or as a consumer.

Attributes: Environment,TechSociety(Disc)

Equivalent(s): PBIO 405

Grade Mode: Letter Grading

SAFS 410 - A Taste of the Tropics

Credits: 4

This course will expose students to the exciting world of tropical agriculture and the ways that people in the tropics utilize a diverse array of food crops. Our lives as consumers in the developed world are touched by tropical products every single day. Whether it's the cinnamon in your tea, the vanilla in your cookies, the black pepper on your salad, or your cup of hot coffee, you likely consume tropical crops whether you know it or not. Ever stop to wonder where these items are from and how they are produced? We will examine agriculture and food culture throughout the tropical world's four principle areas: Latin America, Tropical Asia, Tropical Africa, and the South Pacific. Production systems ranging from large scale modern high input operations to home subsistence gardens are explored. Tropical crops are examined in five major groups: grains and legumes, starchy roots, exotic vegetables, tropical fruit, and herbs, spices, medicinal plants. Cultural uses of these crops throughout the tropical world are given special emphasis.

Attributes: World Cultures(Discovery)

Grade Mode: Letter Grading

SAFS 415 - Introduction to Brewing Art and Science

Credits: 4

Introduction to the scientific foundations of beer brewing. Topics covered will include beer styles; ingredient sourcing; industrial production from nano to macro scale; current trends and topics; quality control; safety and sustainability.

Grade Mode: Letter Grading

SAFS 421 - Introductory Horticulture

Credits: 0 or 4

This course will introduce the disciplines of plant science and horticulture. Students will learn the fundamentals of plant structure and how cells, tissues, organs and whole plants develop and function. Students will then explore how environmental factors affect growth and development, and how humans manipulate them to produce horticultural crops: fruits, vegetables, flowers and landscape plants. Labs are designed to emphasize and reinforce the principles covered in lecture and will give students a hands-on introduction to horticulture. Lab.

Attributes: Biological Science(Discovery); Discovery Lab Course

Equivalent(s): PLSC 421

Grade Mode: Letter Grading

Special Fee: Yes

SAFS #430 - Plant Propagation

Credits: 4

Plant Propagation is an introductory hands-on course. Students will learn the techniques and skills necessary to propagate plants by seed, cuttings, grafting, budding, division, layering, and tissue culture. Students will also learn how plant morphology, anatomy and physiology and the environment influence the success of plant propagation.

Grade Mode: Letter Grading

Special Fee: Yes

SAFS 502 - Agroecology

Credits: 4

This course introduces students to the discipline and practice of agroecology, with an emphasis on relevant ecological theory within the context of production agriculture. Students are exposed to key ecological principles from population, community, and ecosystem ecology and agronomy. Students learn about the history and consequences of modern industrial agricultural systems and the need for more sustainable management practices that consider ecological interactions.

Grade Mode: Letter Grading

SAFS 515 - Technical Brewing

Credits: 4

Technical brewing will focus on learning skills needed in the brewing industry. This hands-on class will focus on sensory, the brewing process, quality control, safety, and sanitation in the brew house. Must be 21 to enroll in the course.

Prerequisite(s): SAFS 415 with a minimum grade of D-.

Grade Mode: Letter Grading

Special Fee: Yes

SAFS 517 - Advanced Aspects of Brewing

Credits: 4

In Advanced Aspects of Brewing, we will examine five specific aspects of the brewing industry: microbiology, waste products, sustainability, engineering, and analytical chemistry. We will utilize the UNH brewery to make a series of unique products that will serve as the testing basis for each module.

Prerequisite(s): SAFS 415 with a minimum grade of D-.

Grade Mode: Letter Grading

Special Fee: Yes

SAFS 601 - Fruit Crop Production

Credits: 4

This course explores the origin, distribution, botany, and cultural practices of fruit crops. Fruit crops represent an important component of both our dietary needs and many agricultural production systems. Emphasis is given to temperate fruit crops suitable for New England growing conditions. Other topics explored include integrating fruit crops into landscapes, organic and conventional cultural practices, and post-harvesting handling.

Prerequisite(s): SAFS 421 with a minimum grade of D-.

Grade Mode: Letter Grading

SAFS 602 - Emphasis Development and Professional Pathways in Sustainable Agriculture and Food Systems

Credits: 1

In this required course, SAFS juniors convene as a cohort to develop their personal Student-Designed Emphases (20 CR), a defining component of the SAFS major. Having completed the broad suite of SAFS foundation courses and at least some program electives by this time, SAFS juniors are well-positioned to reflect upon their evolving interests and chart a thoughtful, upper-level academic path that aligns with their personal and professional goals. Through writing prompts, facilitated peer-to-peer discussions, and faculty-guided development and revisioning of their written emphasis declarations, each student will learn to effectively articulate their area of focus within SAFS while honing their writing and communication skills. To help students connect their Emphases and professional aspirations to university resources, experiential opportunities, and the wide range of careers in the food system, weekly class time will feature interactive guest presentations from SAFS upperclassmen/alumni, program representatives, and food system practitioners.

Grade Mode: Letter Grading

SAFS 620 - Food Systems & Community Resilience

Credits: 4

This course is designed to provide a broad overview of the emerging field of food systems. We will use a systems perspective to better understand how the U.S. food system shapes the food we eat, and the character and health of our communities and environment. In the second half of the course, we will critically evaluate alternative food system development, policies, and initiatives aimed at improving farmers' livelihoods, environmental sustainability, food justice, and community resilience.

Prerequisite(s): SAFS 405 with a minimum grade of D-.

Grade Mode: Letter Grading

SAFS 632 - Urban Agriculture

Credits: 4

Urban agricultural systems play an important role in local food production. Production systems range from community gardens to completely controlled production environments. Urban farmers face unique challenges developing sustainable business models due to high land costs, waste management, post-harvest storage, and limited technical experience. This course provides a practical, hands-on understanding of urban agricultural production systems. Emphasis is placed on controlled environmental agriculture from an urban farmer's perspective through classroom discussion and production systems operation.

Grade Mode: Letter Grading

SAFS 651 - Plant Pathology

Credits: 4

Plant pathology explores the nature, impact and management of plant diseases. Topics covered include organisms and environmental causes of plant diseases and disorders, how plant pathogens interact with host plants and the environment to cause disease, types of diseases, disease development and spread, the human environmental costs of plant diseases, diagnosis, and prevention and management. Students learn to diagnose diseases and disorders through the recognition of symptoms and signs. Laboratory exercises explore the causal agents of plant diseases, symptom and signs, and diagnosis. Lab.

Prerequisite(s): BIOL 409 with a minimum grade of D- or SAFS 421 with a minimum grade of D-.

Equivalent(s): BOT 651, PBIO 651

Grade Mode: Letter Grading

SAFS 670 - Systems Thinking: Land Use Capability and Sustainability in Aotearoa New Zealand**Credits:** 4

This course establishes a conceptual framework in systems thinking to critically examine New Zealand and global examples of the challenges that have arisen from the mismatch between land use and land use capability. Students investigate downstream effects of the rural-urban divide (food-justice), on people, health, services and the environment. Food security, ethical foods, as well as the influence of climate change on food supply and the viability of agribusiness are included.

Co-requisite: INCO 588, SAFS 671, SAFS 672, SAFS 673**Grade Mode:** Letter Grading**Special Fee:** Yes**SAFS 671 - Agroecology and Sustainable Land Management in Aotearoa New Zealand****Credits:** 4

Agroecology is a way of thinking and acting. Using this lens, students investigate the interface of agriculture and the natural environment. Through first-hand experiences with agribusiness, students explore enduring solutions for sustainable food systems. The emphasis will be on dimensions of agroecology that are relevant in a framework of sustainable land management; and on gaining confidence in evaluating processes and science associated with the biological and physical process in agroecosystems.

Co-requisite: INCO 588, SAFS 670, SAFS 672, SAFS 673**Grade Mode:** Letter Grading**Special Fee:** Yes**SAFS 672 - Pathways to Sustainable Agriculture and Food Systems in Aotearoa New Zealand****Credits:** 4

This course empowers students to pursue knowledge and understanding of food systems around the interface of policy, practice, and science to build pathways toward technically robust, economically sound and viable solutions which enable transformation in the rural landscape. Topics include: value systems, socio-cultural benefits of re-thinking food systems at scale, carbon-forestry, carbon offsets, nutrient cap-and-trade models, (Integrated) Catchment Management and Climate Smart Agriculture. Critical thinking and risk assessment tools are integral components.

Co-requisite: INCO 588, SAFS 670, SAFS 671, SAFS 673**Grade Mode:** Letter Grading**Special Fee:** Yes**SAFS 673 - Agricultural Production and Business Practice in Aotearoa New Zealand****Credits:** 4

In this experiential course students will spend time in farm or agribusiness placements. Practical, hands-on experience of the workings of agribusiness provides students with opportunities to enhance their autonomy and capacity as active learners. Students will gain transferable skills, increase competency and develop a comprehensive understanding of sustainability initiatives and practices of food systems. Students can transfer insights from classroom work to a practical setting and bring previously developed skills to a new context.

Co-requisite: INCO 588, SAFS 670, SAFS 671, SAFS 672**Grade Mode:** Letter Grading**Special Fee:** Yes**SAFS 679 - Food Production Field Experience I****Credits:** 4

This is part one of a two course series to be taken during spring semester. Course provides students with hands-on experience in growing food and managing a small farm business. We will be growing fresh vegetables and some fruits for the UNH Dairy Bar. Lectures, readings, and hands-on activities during Part I focus on all aspects of production: propagation, crop establishment, irrigation, crop management, soil considerations, and pest and disease practices.

Prerequisite(s): SAFS 405 with a minimum grade of D-.**Grade Mode:** Letter Grading**SAFS 680 - Food Production Field Experience II****Credits:** 4

This is part of a two course series to be taken during fall semester. Course provides students with hands-on experience in growing food and managing a small farm business. We will be growing fresh vegetables and some fruits for the UNH Dairy Bar. Lectures, readings, and hands-on activities in part two focus on crop harvesting and maturity, post-harvest considerations, marketing, special event planning and execution, record keeping, and small farm business management.

Prerequisite(s): SAFS 405 with a minimum grade of D- and SAFS 679 with a minimum grade of D-.**Grade Mode:** Letter Grading**SAFS 689 - Greenhouse Management and Operation****Credits:** 4

Course provides introduction to greenhouse construction, design, environmental control, and current trends in the industry. Fundamentals of starting a greenhouse business including safety and labor, marketing, and post-harvest considerations also covered. Efforts towards making the greenhouse industry more sustainable are explored alongside with certification options and procedures. Crops representative of current major New England crops are grown during lab. Students learn about crop selection and practices including IPM, irrigation, and fertility management. Lab. (Offered alternate years).

Attributes: Writing Intensive Course**Prerequisite(s):** SAFS 421 with a minimum grade of D-.**Equivalent(s):** P BIO 689**Grade Mode:** Letter Grading**Special Fee:** Yes**SAFS 733 - Advanced Topics in Sustainable Agriculture****Credits:** 4

In this writing-intensive, capstone course, SAFS juniors and seniors engage in critical, student-led discussion of instructor-chosen and student-selected works related to food systems sustainability across scales, local to global. With these discussions as context, students pursue individual, semester-long projects to practically address a specific issue of interest. The course aims to improve critical reading, writing, discussion, and presentation skills; build cohort cohesiveness; and challenge students' beliefs and working assumptions about agriculture and food systems sustainability.

Attributes: Writing Intensive Course**Grade Mode:** Letter Grading

SAFS 750 - Food System Solutions; Increasing Sustainability and Equity

Credits: 4

We will study a range of solutions to address cross-cutting issues in the food system, including unsustainable farming systems, inequitable access to nutritious food, dietary patterns that promote chronic disease, and the lack of sustainable livelihoods for farmers and food chain workers. Students will learn to critically examine policies, programs and social movements aimed at increasing the equity and sustainability of the food system. We will identify the strengths and weaknesses of these approaches, recognizing the limits and blind spots, uneven impacts, and leverage points of the proposed solutions we study.

Attributes: Writing Intensive Course

Prerequisite(s): SAFS 620 with a minimum grade of D- or NUTR 730 with a minimum grade of D-.

Grade Mode: Letter Grading

SAFS #760 - Insect Pest Management

Credits: 4

Students learn the principles of integrated pest management, as they apply to insects (and some other arthropods). Additionally, they learn to recognize the major orders of insects, and some insect families that are important as natural enemies of pests. Course incorporates a significant amount of writing, plus learning to search the scientific literature.

Attributes: Writing Intensive Course

Prerequisite(s): BIOL 411 with a minimum grade of D- and BIOL 412 with a minimum grade of D-.

Equivalent(s): PBIO 760

Grade Mode: Letter Grading

SAFS 795 - Investigations

Credits: 1-4

With faculty guidance, students work on individual projects related to sustainable agriculture and food systems.

Repeat Rule: May be repeated for a maximum of 8 credits.

Equivalent(s): SAFS #795W

Grade Mode: Letter Grading

SAFS #795W - Investigations

Credits: 1-4

With faculty guidance, students work on individual projects related to sustainable agriculture and food systems.

Attributes: Writing Intensive Course

Repeat Rule: May be repeated for a maximum of 8 credits.

Equivalent(s): SAFS 795

Grade Mode: Letter Grading

SAFS 799 - Honors Senior Thesis

Credits: 1-4

Independent research requiring a written proposal, thesis, and presentation of research results to an audience of faculty and/or students. Intended for students completing SAFS Honors-in-Major requirements. Contact SAFS Program coordinator prior to senior year to arrange supervision and obtain permission. Two-semester sequence; students typically register for 5 credits over two semesters. IA grade (continuous course) given at end of first semester.

Attributes: Honors course; Writing Intensive Course

Repeat Rule: May be repeated for a maximum of 8 credits.

Grade Mode: Letter Grading

Faculty