SAFS 420 - 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.

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. Special Fee. Lab.

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. Special Fee.

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. Prereq: SAFS 415. Special fee.

SAFS 600 - Field Experience
Credits: 0
As part of their degree program, students are expected to engage in a work experience or internship under professional supervision and approved by sustainable agriculture faculty. Provides the opportunity to apply academic knowledge in settings associated with future professional employment and/or related graduate opportunities. Must be approved by a faculty advisor selected by the student. Permission required. Cr/F.

Equivalent(s): SAFS 600W
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. Prereq: SAFS 421 or permission.

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. Prereq: SAFS 405, or instructor permission.

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.

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 casual agents of plant diseases, symptom and signs, and diagnosis. Prereq: BIOL 409 or SAFS 421, or instructor permission. Lab.  
Equivalent(s): BOT 651, PBO 651

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. Special Fee.  
Co-requisite: INCO 588, SAFS 671, SAFS 672, SAFS 673

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. Special Fee.  
Co-requisite: INCO 588, SAFS 670, SAFS 672, SAFS 673

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 sale, 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. Special Fee.  
Co-requisite: INCO 588, SAFS 670, SAFS 671, SAFS 673

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 transferrable 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. Special Fee.  
Co-requisite: INCO 588, SAFS 670, SAFS 671, SAFS 672

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. Prereq: SAFS 405 or permission of instructor.

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. Prereq: SAFS 405, SAFS 679 or permission of instructor.
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. Prereq: SAFS 421 or permission of the instructor. Lab. Special fee. (Offered alternate years). Writing intensive.  
**Attributes:** Writing Intensive Course  
**Equivalent(s):** PBIO 689

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. Pre- or Coreq: Must be SAFS junior or senior, or by permission. Writing intensive.  
**Attributes:** Writing Intensive Course

SAFS 740 - Aquaponics  
**Credits:** 4
Aquaponics integrates aquaculture and hydroponic systems producing fish and plants. The integration of these systems first requires an understanding of the needs for each system. The experiential course will dive into the concept of turning wastes into resources with hands-on growing and management experience in aquaponic food production systems. We will cover the fundamentals, and challenges of integrating recirculating aquaculture and hydroponic systems. Students are required to sign up for one farm day per week.

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. Prereq: BIOL 411 and BIOL 412 or equivalent. Writing intensive.  
**Attributes:** Writing Intensive Course  
**Equivalent(s):** PBIO 760

SAFS 795 - Investigations  
**Credits:** 1-4
With faculty guidance, students work on individual projects related to sustainable agriculture and food systems. Permission required.  
**Repeat Rule:** May be repeated for a maximum of 8 credits.  
**Equivalent(s):** SAFS 795W

SAFS 795W - Investigations  
**Credits:** 1-4
With faculty guidance, students work on individual projects related to sustainable agriculture and food systems. Permission required.  
**Attributes:** Writing Intensive Course  
**Repeat Rule:** May be repeated for a maximum of 8 credits.  
**Equivalent(s):** SAFS 795

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. Writing intensive.  
**Attributes:** Honors course, Writing Intensive Course  
**Repeat Rule:** May be repeated for a maximum of 8 credits.