

AGRICULTURE, NUTRITION, AND FOOD SYSTEMS

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

Overview

Students joining the Agriculture, Nutrition, and Food Systems Department have the opportunity to study facets of the farm-to-fork-to-human and animal wellness connection. Our Department is organized in this way in order to provide students with a holistic view of this continuum but also to enable students to specialize in their chosen field.

Programs in this department include animal science, equine sciences, nutritional sciences and sustainable agriculture and food systems. Our majors have extensive course offerings, access to our farm and research facilities, and an outstanding and dedicated teaching and research faculty. We offer a number of integrated study abroad programs including travel to Costa Rica, Ireland, Italy, and New Zealand. Our graduates are well prepared for careers in the sustainable food systems, dairy, equine, fish aquaculture, food crop and ornamental plant industries, as nutritional scientists or registered dietitians, or to pursue veterinary or M.S. and Ph.D. degrees.

Programs

- [Animal Science](#)
- [Equine Studies](#)
- [Nutrition](#)
- [Sustainable Agriculture & Food Systems](#)

Courses

Animal Science (ANSC)

ANSC 401 - Animals and Society

Credits: 0 or 4

Through an interdisciplinary and historical lens, students delve into the interaction and interdependence of animals and people, the changes and patterns over time, and the resulting implications for the animal industry and the quality of life for animals, people, and the planet. Topics covered include agricultural production, organic farming, sustainability, global agriculture, Community Supported Agriculture (CSAs), research, nutrition, food safety, genetics, animal health, aquaculture, animal welfare, breeding, recreation, companionship, and the reproduction of domestic animals. What are the major changes in meat consumption by humans? What is the effect of these changes on the environment and large and small farm operations? What are the effects of biotechnological research performed on animals for human benefits? What is the difference between animal welfare and animal rights? Why should we care? In what ways does this affect us?

Attributes: Biological Science(Discovery); Discovery Lab Course

Grade Mode: Letter Grade

ANSC 402 - Horsemanship Lab

Credits: 1

For beginning, intermediate, and advanced riders. Lab (lesson) format with required co-requisite (hybrid or on-line). Correct position and technique for dressage and combined training with application of appropriate theory. Allow time before and after lab for horse care. For the safety of horse and rider, there is a rider weight limit of 200 pounds for all mounted activities in the UNH Equine Program, including ANSC 402.

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

Grade Mode: Credit/Fail

ANSC 405 - Theory of Horsemanship

Credits: 2

Principles and theory of horsemanship, dressage and jumping, including biomechanics of the horse and rider, rider position and aids, cross-country jumping and conditioning, and the horse's instincts, senses, behavior and training as they relate to riding. Online only.

Grade Mode: Letter Grade

ANSC 406 - Careers in Animal Science

Credits: 1

Students explore a variety of career opportunities within the fields of biotechnology, agriculture, animal science and veterinary medicine. Through class presentations and guest speakers students will learn about steps they could take to enhance their prospects for career success, including the internships, career related employment, research, and study abroad opportunities. Students will also prepare a draft and final resume, articulate a career plan, and write reviews about each of the guest speakers and panelists.

Grade Mode: Letter Grade

ANSC 411 - Freshman Seminar in Equine Science

Credits: 1

Seminar format class. This introductory level class provides students with an overview of the equine industry, its economic impact and pressures and the job opportunities available. Class also includes investigation of the requirements and options within the UNH Equine Program and exploration of the opportunities and resources available for students. Cr/F.

Grade Mode: Credit/Fail

ANSC 419 - Horse Power

Credits: 4

Students explore the enduring bond between the horse and man and the effect of that bond on civilization by considering: How has the horse and man's use of the horse shaped civilization and contributed to societal change? How has the progress of civilization and societal change affected the horse and its role in society? What does our use of the horse say about us as individuals and as a society? Cannot receive credit if credit received for ANSC 444B.

Attributes: Humanities(Disc)

Equivalent(s): ANSC 444B

Grade Mode: Letter Grade

ANSC 421 - Introduction to Animal Science

Credits: 4

This course provides an overview of the scope and diversity of animal agriculture at the global, national and local levels. It also provides an introduction to the animal sciences through which students 1) learn basic animal science terminology 2) acquire an appreciation of the objectives of various animal enterprises and 3) gain understanding of contemporary trends, challenges and opportunities within animal agriculture. Special fee.

Grade Mode: Letter Grade

ANSC 422 - Introduction to Horsemanship Theory**Credits:** 3

For beginning and intermediate riders enrolled in ANSC 402. Hybrid format, includes face-to-face and on-line content, with required lab co-requisite (ANSC 402). Correct theory of basic horsemanship skills, including safe handling practices, introduction to equipment and horse sports, overview of equine senses and behavior, and correct rider position and technique for dressage and jumping. See ANSC 402 (co-requisite) for details on required lab activities. Permission required.

Co-requisite: ANSC 402**Grade Mode:** Letter Grade**ANSC 426 - Equine Conformation and Lameness****Credits:** 4

The study of conformation as it relates to soundness and performance. Students learn to recognize the components of good conformation as they relate to the athletic functions of the horse. Field trips highlight varying disciplines and how conformational changes make horses appropriate for differing activities. Students will also use the University herd to practice assessing conformation and its evaluation for performance types. Students will also learn how conformational faults impact long term soundness. Special fee.

Equivalent(s): AAS 426**Grade Mode:** Letter Grade**ANSC 437 - Equine Husbandry Techniques****Credits:** 0 or 4

Course familiarizes students with different aspects of equine management through a practical and hands-on approach. Topics include selection, fit and care of English tack, bits, grooming, clipping, wound care, safe bandaging techniques, equine behavior, farm layout, basic health care and monitoring, parasite control, and equine transportation. Students will have hands-on experience in the UNH stable. Responsibilities include feeding, cleaning, turnout, and basic care of the University herd. Special Fee.

Equivalent(s): AAS 437**Grade Mode:** Letter Grade**ANSC 500 - Equine Assisted Activities and Therapies****Credits:** 4

Comprehensive examination of Equine Assisted Activities and Therapies including types of therapeutic riding and its physical, cognitive, and emotional benefits for clients with a variety of disabilities. Topics include hippotherapy, therapeutic riding, equine-facilitated mental health, youth at risk, therapeutic vaulting, carriage driving, equipment needs/modifications, special considerations for selecting and training the therapy horse, and the role of the volunteer therapist and instructor. Students have the opportunity to work with horses and riders in the UNH Therapeutic Riding Program during labs, as well as view other programs on mandatory field trips. Special fee.

Grade Mode: Letter Grade**ANSC 504 - Equine Physiology****Credits:** 4

A fundamental equine science course including anatomy, sports medicine, nutrition and preventative care. Students present oral and written journal reviews on equine science topics pertinent to lecture. Prereq: BIOL 412. Special Fee.

Equivalent(s): ANSC 404**Grade Mode:** Letter Grade**ANSC 507 - Survey of Equine Training Techniques****Credits:** 3

Physiological development, control, and education; biting, lunging, driving, and equine gymnastics. Special fee. Lab.

Grade Mode: Letter Grade**ANSC 510 - Integration of Culture and Agriculture in Ireland: Past, Present, and Future****Credits:** 2 or 4

What was the worst natural disaster in 19th century Europe? What characterizes Ireland's agriculture in the 21st century? In this interdisciplinary course, students examine the cultural, historical, political, economical, and religious influences on Ireland's agriculture, fisheries, and forestry. The crowning experience of the course, a 10-day study abroad in late May, provides students with a window to the world as they experience the culture, agriculture, and topography of Ireland. Students will immerse themselves in local history and culture as they tour working agricultural farms, university research facilities, and cultural landmarks. Permission required. Not open to freshmen. Special fee. Writing intensive. 2 or 4 credits.

Co-requisite: INCO 589**Attributes:** World Cultures(Discovery); Writing Intensive Course**Grade Mode:** Letter Grade**ANSC 511 - Anatomy and Physiology****Credits:** 0 or 4

Discussion/comparison of the principles of mammalian form and function. Includes molecular and cellular mechanisms of major processes (such as muscle contraction, neural transmission, and signal transduction) and systematic aspects of the nervous, endocrine, cardiovascular, respiratory, gastrointestinal, and renal systems. Prereq: BIOL 411 and BIOL 412. Special fee. Lab. Not open to Freshmen.

Mutual Exclusion: No credit for students who have taken BMS 507.**Grade Mode:** Letter Grade**ANSC 512 - Anatomy and Physiology****Credits:** 0 or 4

Discussion/comparison of the principles of mammalian form and function. Includes molecular and cellular mechanisms of major processes (such as muscle contraction, neural transmission, and signal transduction) and systematic aspects of the nervous, endocrine, cardiovascular, respiratory, gastrointestinal, and renal systems. Prereq: BIOL 411 and 412 and ANSC 511. Special fee. Lab. Not open to freshmen.

Equivalent(s): ZOO 508, ZOO 518**Mutual Exclusion:** No credit for students who have taken BMS 508.**Grade Mode:** Letter Grade**ANSC 522 - Intermediate Horsemanship Theory****Credits:** 3

For intermediate and advanced riders, and beginners who have completed ANSC 422. Hybrid format, includes face-to-face and online lectures/content with required lab (ANSC 402) as co-requisite. Correct theory of more advanced horsemanship skills and concepts, including equine behavior and learning, horse and rider biomechanics, correct rider techniques for dressage and combined training, and systematic athletic development of the horse for dressage and jumping. Permission required.

Co-requisite: ANSC 402**Equivalent(s):** ANSC 405**Grade Mode:** Letter Grade

ANSC 536 - Preparation and Competition Techniques for the Modern Sport Horse**Credits:** 4

Course addresses the safe handling and appropriate grooming and clipping techniques for modern sport horses as they are prepared for competition. Additional topics include trailering, studding, post-workout care and other industry skills. Students will evaluate selection and movement of sport-horses while in-hand and demonstrate knowledge by showing horses in best practice for the type and style. Students will demonstrate horse-handling proficiency while showing their assigned horse in-hand at the annual Little Royal Livestock & Horse Show. Lecture and lab format, including industry guest speakers and demonstration. Prereq: ANSC 437, ANSC 422/ANSC 522/ANSC 402.L or instructor permission.

Equivalent(s): AAS 536**Grade Mode:** Letter Grade**ANSC 538 - Equine Handling/Longeing****Credits:** 1

This seven-week intensive course provides students with the opportunity to learn to longe a variety of University horses in an enclosed arena under private instruction. The emphasis is on safety and welfare of the horse and handler. Proper equipment and fit are addressed along with different training techniques used to improve the horse's quality of movement.

Equivalent(s): AAS 538**Grade Mode:** Letter Grade**ANSC 543 - Technical Writing in Animal Sciences****Credits:** 2

Emphasis on writing scientific articles and articles for the end user on subjects pertaining to the animal science industry. Students are expected to make several oral presentations. Resume preparation is also included. Prereq: ENGL 401 or equivalent; permission. Writing intensive.

Attributes: Writing Intensive Course**Equivalent(s):** ANSC 743**Grade Mode:** Letter Grade**ANSC 546 - Animal Business Applications****Credits:** 4

Survey of the various elements of managing an animal and/or agricultural operation regardless of commodity. Topics include: financial statements, credit and interest, insurance considerations, labor management, marketing, promotions, advertising, and sales.

Equivalent(s): AAS 546**Grade Mode:** Letter Grade**ANSC 547 - Equine Stable Management****Credits:** 3

Students learn how to make equine management decisions based upon science and business principles. Topics covered include evaluating health parameters, hoof care, vaccination and parasite control, nutrition, accurate record keeping and housing. Students monitor horse health, vaccinate, pull shoes and do fecal exams using the University herd. Business topics include; the importance of contracts, efficient staffing, stable/arena design for function. Field trips highlight different sized equine enterprises. Prereq: ANSC 437. Special Fee.

Equivalent(s): AAS 547**Grade Mode:** Letter Grade**ANSC 548 - Agricultural Business Management****Credits:** 4

This course is designed to give students an opportunity to focus on the agricultural industry relative to specific, operational concepts such as small business start-up, creating a business plan, funding strategies, business development including SWOT analysis, market analysis, branding, product placement and pricing strategy, advertising and using social media, employee hiring and management, supply chain management and analyzing financial statements. An examination of sustainable and socially and environmentally responsible business practices will also be included. The course involves lecture and field study allowing students to examine similar agricultural operations in order to enhance practical understanding of topics covered.

Equivalent(s): AAS 548, ANSC 635**Grade Mode:** Letter Grade**ANSC 600 - Field Experience****Credits:** 1-4

A supervised experience providing the opportunity to apply academic experience in settings associated with future professional employment and/or related graduate opportunities. Must be approved by a faculty adviser selected by the student. Permission of supervising faculty member required. Cr/F.

Repeat Rule: May be repeated for a maximum of 8 credits.**Grade Mode:** Credit/Fail**ANSC 602 - Animal Rights and Societal Issues****Credits:** 4

To explore all aspects of human-animal interaction and welfare, emphasizing social, ethical, biological, historical and economic aspects of animal care and use. (Juniors and seniors only.) Special fee. Writing intensive.

Attributes: Writing Intensive Course**Equivalent(s):** ANSC 407**Grade Mode:** Letter Grade**ANSC 603 - Introduction to Livestock Management****Credits:** 4

This course explores the economic, scientific, and practical aspects of livestock management in New England, related to swine, beef, cattle, sheep, goats, and rabbits. This will include breed selection, feeding, reproduction, health, and housing systems. Product harvesting and food safety regulations related to sales and marketing are explored. Students will also be required to manage and care for a flock of sheep at UNH as part of their weekly laboratory exercises. Prereq: ANSC 421, or instructor permission.

Grade Mode: Letter Grade**ANSC 605 - Poultry Production and Health Management****Credits:** 4

This course focuses on understanding how the management practices used in raising domestic poultry can promote the production of healthy birds. Discussion centers on chickens in both large and small commercial flocks. Topics covered include breed and stock selection, anatomy & physiology, hatcher and brooder management, commercially important diseases, biosecurity and preventative health care, applicable food safety practices, and welfare. Students will gain hands-on experience working with live poultry during this course. Prereq: ANSC 421, AAS 431, or permission.

Grade Mode: Letter Grade

ANSC 609 - Principles of Animal Nutrition**Credits:** 4

Applied animal nutrition and nutrient metabolism. Prereq: one year of chemistry; one semester of physiology.

Grade Mode: Letter Grade**ANSC 612 - Genetics of Domestic Animals****Credits:** 0 or 4

Application of basic and molecular genetics to the diagnosis and control of inherited diseases of domestic animals and application of quantitative genetics for the improvement of economically important traits of farm animals. Prereq: BIOL 411 or permission.

Grade Mode: Letter Grade**ANSC 622 - Further Explorations in Horsemanship Theory****Credits:** 2

For intermediate and advanced riders who have already completed ANSC 522. Online format, with required lab (ANSC 402) as a co-requisite. Students will use online content and independent study projects for in-depth explorations of more advanced topics related to the theory of dressage, jumping, and horsemanship, with particular attention to the application of correct theory to the individual rider's current skills, goals, and lab activities. May be repeated, with a different focus in subsequent semesters. Prereq: ANSC 522 and Permission.

Co-requisite: ANSC 402**Repeat Rule:** May be repeated for a maximum of 10 credits.**Grade Mode:** Letter Grade**ANSC 625 - Animal Diseases****Credits:** 4

This course focuses on concepts of animal health and disease primarily as they relate to domestic agricultural species. Basic principles of diagnosis, transmission treatment, and prevention are introduced and applied to the presentation of specific disease conditions. The course is divided into sections that focus on the primary body system that is affected by the disease or disorder and a heavy emphasis is placed on learning the skills necessary to recognize and prevent disease. Prereq: AAS 439, ANSC 511, ANSC 512.

Grade Mode: Letter Grade**ANSC 635 - Nonprofit Management for Agriculture Business****Credits:** 4

This course is designed to give students an opportunity to focus on the agriculture industry relative to specific operational topics for nonprofit businesses. Case studies will include therapeutic riding, agricultural nonprofits, animal welfare/rescue field, animal or agricultural educational programs and nonprofit foundations and the growing field of animal and plant therapy. Topics include; legal structure and organization, credentialing, developing a strategic plan, creating and managing a board of directors, staff and volunteer management, risk management and insurance, fundraising, marketing and public relations, using social media and public accountability. Special consideration will be given to understanding and utilizing financial statements to drive the business and fundraising efforts. The course will involve lecture and project management allowing student to examine similar agricultural business operations in order to enhance practical understanding of topics covered for a final project. Course is offered biennially, in the Fall semester of even-numbered years.

Equivalent(s): ANSC 548, CSL 402, CSL #508**Grade Mode:** Letter Grade**ANSC 640 - Principles of Riding Instruction****Credits:** 4

Introduction to the principles, theory and practice of Riding Instruction. Includes discussion of styles of learning and instruction as applied to a riding environment, student assessment, skill acquisition, lesson planning, horse selection and principles of group and private riding instruction. Students will use lab time to observe, assist and practice teaching in sections of ANSC 402, which will be matched according to their abilities and interests. Students will prepare for ARIA licensing examinations as part of class. Fall semester only. Lab. Prereq: ANSC 405 or ANSC 522.

Attributes: Writing Intensive Course**Grade Mode:** Letter Grade**ANSC 641 - Principles of Dressage Instruction****Credits:** 2

Advanced principles and theory of dressage and advanced concepts in teaching and coaching dressage. Students will use lab time to observe, assist and practice teaching in dressage-only sections of ANSC 402. Students will prepare for ARIA licensing examinations as part of class. Spring semester only. Lab. Prereq: ANSC 640.

Grade Mode: Letter Grade**ANSC 642 - Principles of Jumping Instruction****Credits:** 2

Advanced principles and theory of jumping and advanced concepts in teaching and coaching over fences in the arena and cross-country. Students use lab time to observe, assist and practice teaching in intermediate I and II level sections of ANSC 402. Lab. Prereq: ANSC 640. Offered spring semester of every odd numbered year.

Grade Mode: Letter Grade**ANSC 643 - Principles of Therapeutic Riding Instruction****Credits:** 4

Principles and theory of teaching therapeutic riding, including special considerations of teaching in a therapeutic environment and methods of instruction for individuals with a variety of disabilities. Lab consists of observing, assisting and practice-teaching in UNH Therapeutic Riding Program as preparation for PATH International CTRI instructor certification. Spring semester only, biannually, odd numbered years. Prereq: ANSC 500 and ANSC 437 or ANSC 402 or equivalent.

Grade Mode: Letter Grade**ANSC 650 - Dairy Industry Travel Course****Credits:** 1

Extended field trip to a variety of dairy farms and dairy related businesses in the Northeast with students and faculty from other New England land grants. Includes discussion sessions, case study, problem solving, and journal report. Prereq: permission. Special fee.

Repeat Rule: May be repeated for a maximum of 2 credits.**Grade Mode:** Letter Grade

ANSC 665 - Principles of Horse Trials Management**Credits:** 2

Theory and hands-on involvement in the organizational process of managing an event competition. Topics will include budgeting, logistical needs, working with entries, sponsorship, awards, publicity, facilities management, course design and committee management. Students will actively participate in the management and preparation of the UNH Horse Trials, overseeing the committees working in the phases of the event and also performing other responsibilities. 1-credit, half semester course. (During the fall semester, the class will meet for the first half of the semester; during the spring semester, the class will meet for the second half of the semester)

Equivalent(s): ANSC 565**Grade Mode:** Letter Grade**ANSC 670 - Exotic Companion Species Health and Management****Credits:** 4

This course focuses on concepts of health and disease as they relate to companion zoological species (i.e. exotic pets and those species kept in small, living collections) management. Developing an understanding of species specific needs and utilizing this knowledge to promote physical and mental health in a captive environment will be core themes of the course. Prereq: BIOL 411 & BIOL 412, previous coursework in animal anatomy & physiology recommended.

Grade Mode: Letter Grade**ANSC 690 - Livestock and Wildlife in Namibia: Challenges, Opportunities and Geography****Credits:** 4

This course explores the economic, historic, geographic, scientific and cultural aspects of livestock and wildlife management in Namibia.

Its people developed unique models of conservation, as alternatives to national parks and private land in managing wildlife and livestock. Students will gain insight into this unique country and its animals, through lecturers, research, writing and direct interaction with practitioners in the study abroad component. Special Fee.

Attributes: World Cultures(Discovery); Writing Intensive Course**Grade Mode:** Letter Grade**ANSC 695 - Supervised Teaching Experience****Credits:** 1-2

Participants are expected to perform such functions as leading discussion sections, directing and assisting in laboratories, and assisting students with their problems in courses that participants have completed successfully. Enrollment is limited to juniors and seniors who have a minimum 3.00 cumulative average. Prereq: permission of instructor and department chairperson. Cr/F.

Repeat Rule: May be repeated for a maximum of 4 credits.**Grade Mode:** Credit/Fail**ANSC 698 - Cooperative for Real Education in Agricultural Management (CREAM)****Credits:** 4

CREAM (Cooperative for Real Education in Agricultural Management) is a 2-semester course in which students perform the work and make the financial management decisions associated with the CREAM dairy herd. Students assume complete responsibility for the management and care of the 25-cow herd for the entire academic year. CREAM provides students with a unique experiential learning model that will help them understand how to work together to manage and operate a small business, the decision-making skills required in production agriculture and the application of science to the management of a dairy herd. Two semesters of 4 cr. each are required. Prereq: AAS 425 or permission.

Repeat Rule: May be repeated for a maximum of 8 credits.**Equivalent(s):** AAS 275, ANSC 615**Grade Mode:** Letter Grade**ANSC 701 - Physiology of Reproduction****Credits:** 4

Comparative aspects of embryology, anatomy, endocrinology, and physiology of reproduction. Lab.

Grade Mode: Letter Grade**ANSC 708 - Ruminant Nutritional Physiology****Credits:** 3

Anatomy of the ruminant gastrointestinal tract, physiological factors related to rumen function, and microbial and whole-body metabolism of carbohydrates, protein, and lipids. Prereq: BMS 503 and BMS 504 or equivalent.

Grade Mode: Letter Grade**ANSC 710 - Dairy Nutrition****Credits:** 4

Feeding management of dairy cattle. Emphasis on feedstuffs, nutritional requirements, and diet formulation for efficient production and optimum health. Prereq: ANSC 609 or NUTR 750; permission.

Grade Mode: Letter Grade**ANSC 715 - Physiology of Lactation****Credits:** 4

Examines the biological and biochemical influences of the lactation process. Emphasis on the physiological effects of environments, hormones, and nutrition on milk synthesis and secretion, mammary physiology, and maternal response. Prereq: ANSC 701, permission.

Grade Mode: Letter Grade**ANSC 724 - Reproductive Management and Artificial Insemination****Credits:** 4

Focus on goals and fundamentals of reproductive management of horses, dairy and livestock animals, and through actual experience, development of competency in performing modern breeding techniques for equine and bovine reproduction. Permission required. Special fee. Lab.

Equivalent(s): ANSC 652**Grade Mode:** Letter Grade**ANSC 725 - Equine Sports Medicine****Credits:** 4

Course focuses on equine anatomy and physiology in relation to athletic performance and injury. Students write an independent paper assessing the use of an equine heart rate monitor on either a UNH or private horse during the semester. (Juniors and seniors only.) Prereq: ANSC 504, 512, 620. Special fee.

Grade Mode: Letter Grade

ANSC 727 - Advanced Dairy Management I**Credits:** 4

Advanced management evaluation of milking procedures, reproduction, genetics, herd health, feeding, housing, and milking systems. Prereq: junior or senior standing; permission.

Equivalent(s): ANSC 615**Grade Mode:** Letter Grade**ANSC 728 - Advanced Dairy Management II****Credits:** 4

Advanced management evaluation of record keeping, financial and business management, personnel management, waste management, and marketing. Prereq: junior or senior standing; permission. Special fee. Writing intensive.

Attributes: Writing Intensive Course**Grade Mode:** Letter Grade**ANSC 744 - Advanced Concepts in Therapeutic Riding Instruction****Credits:** 4

This course combines weekly lectures and practice teaching in the UNH Therapeutic Riding Program. Advanced concepts will be explored for mounting and dismounting participants with a higher degree of disability as well as teaching techniques for riders with less mobility and / or significant behaviors. Upon completion of this course, students will be prepared to sit for the national Certified Therapeutic Riding Instructor (CTRI) exam at an additional cost paid to the Professional Association of Therapeutic Horsemanship International (PATH International). Course is not offered every year. Prereq: ANSC 643.

Grade Mode: Letter Grade**ANSC 750 - Collaborative Farm Design and Development****Credits:** 4

As a semester long group project, students will design an economically feasible, fully operational, diversified small farm. Students will need to consider site selection, infrastructure, equipment, labor, animal production and health, financing options, marketing and sales, etc. in their design. The final project will be presented in both an oral and a written format. Independent initiative and group collaboration are both integral to success in this project. Writing intensive.

Attributes: Writing Intensive Course**Equivalent(s):** ANSC 750W, NUTR 750, NUTR 750W**Grade Mode:** Letter Grade**ANSC 795 - Investigations****Credits:** 1-4

Investigations in genetics, nutrition, management, diseases, histology, equestrian management/agribusiness, physiology, cell biology, microbiology, dairy management, or teaching experience. Prereq: permission.

Repeat Rule: May be repeated for a maximum of 4 credits.**Equivalent(s):** ANSC 795W**Grade Mode:** Letter Grade**ANSC 795W - Investigations****Credits:** 1-4

Investigations in genetics, nutrition, management, diseases, histology, equestrian management/agribusiness, physiology, cell biology, microbiology, dairy management, or teaching experience. Prereq: permission.

Attributes: Writing Intensive Course**Repeat Rule:** May be repeated for a maximum of 4 credits.**Equivalent(s):** ANSC 795**Grade Mode:** Letter Grade**ANSC 796 - Equine Senior Seminar****Credits:** 2

This course is geared to prepare graduating seniors for professional work experience, including skills related to job seeking, resume preparation and interviewing for work in the equine field. In addition, students will engage in dialogue regarding current and relevant controversial topics within the equine industry. Through guided group discussion, selected readings and guest speakers, student are exposed to subjects which equine professionals must confront and address within the equine industry.

This course serves as a preparation for and pre-requisite to the Equine Capstone Experience, ANSC 797.

Equivalent(s): ANSC 697, ANSC 796W**Grade Mode:** Credit/Fail**ANSC 797 - Equine Capstone Experience****Credits:** 4

This course allows students to review critical professional skills, concepts and theories necessary for success within the equine industry and then to demonstrate competence in these areas, to a panel of equine program faculty. Students also coordinate logistics and content of an outreach Equine Education Day. Successful completion allows students to showcase professional skills and abilities to the non-academic equestrian community. Prereq: ANSC 796.

Grade Mode: Letter Grade**ANSC 799 - Honors Senior Thesis****Credits:** 1-4

Independent research culminating with a written honors thesis in A) Genetics; B) Nutrition; C) Management; D) Diseases; E) Histology; F) Light Horsemanship; G) Physiology; H) Cell Biology; I) Microbiology; J) Dairy Management. Prereq: permission. IA.

Attributes: Honors course; Writing Intensive Course**Repeat Rule:** May be repeated for a maximum of 8 credits.**Grade Mode:** Letter Grade

Nutrition (NUTR)

NUTR 400 - Nutrition in Health and Well Being**Credits:** 0 or 4

Addresses scientific principles of human nutrition to promote health and well-being. Overview of the biological significance of food and nutrition, specific nutrient functions, and how the supply and demand of food impacts physical health and well-being. Emphasis on scientific literacy and an appreciation of the ways in which we gain scientific knowledge and understanding. Special fee. Lab.

Attributes: Biological Science(Discovery); Discovery Lab Course**Equivalent(s):** ANSC 400, NUTR 400H, NUTR 475**Grade Mode:** Letter Grade**NUTR 401 - Professional Perspectives on Nutrition****Credits:** 1

Examines the many opportunities for dietitians and nutrition science professionals, from farm to fork, to health and nutrition outcomes. Students meet and interact with faculty and explore career paths and nutrition strategies in the food and nutrition science fields. Legal and ethical considerations for these professionals are discussed. Content areas for specialization in nutritional sciences, dietetics, health and wellness are reviewed, as well as the Ecogastronomy dual major. Cr/F. Prereq: freshmen, sophomore standing or permission.

Grade Mode: Credit/Fail

NUTR 403 - Culinary Arts Skills Development**Credits:** 4

This laboratory class explores classical culinary and basic cooking techniques. Classical recipes for stocks, mother sauces, soups and pie crust, quick and yeast breads are featured with hands-on experiential learning using common practices and techniques of the food service industry. Students will gain an understanding of basic ingredients, fabrication, storage, cooking, hygiene and sanitation, equipment usage in modern culinary through demonstration, practice and evaluation. Special Fee.

Equivalent(s): CAN 403**Grade Mode:** Letter Grade**NUTR 405 - Food and Society****Credits:** 4

Consideration of the cultural significance of food, emphasizing historical, psychological, social, political, and economic aspects. (Spring semester only.)

Attributes: Social Science (Discovery)**Equivalent(s):** ANSC 405, NUTR 405W**Grade Mode:** Letter Grade**NUTR 476 - Nutritional Assessment****Credits:** 0 or 4

Designed for the student who plans to enter the health care profession. Introduces the concepts of nutritional assessment and the practical application of these concepts in the nutritional care of clients in clinical, community, and research settings. Prereq: NUTR 400. Special fee.

Grade Mode: Letter Grade**NUTR 504 - Managerial Skills in Dietetics****Credits:** 4

Emphasis on the basic principles of managing clinical, community, and food service operations, including personnel management, in-service and on-the-job training, policy and procedure development, negotiation techniques, facilities, equipment selection, and financial management.

Equivalent(s): NUTR 503**Grade Mode:** Letter Grade**NUTR 506 - Nutrition and Wellness****Credits:** 4

Course assists students in making informed decisions affecting personal and societal wellness. Emphasis on the dimensions of wellness, including the impact of psychological, emotional and physical health, as well as environmental influences that affect behavior. Prereq: NUTR 400 or equivalent.

Mutual Exclusion: No credit for students who have taken EXSC 527, KIN 527.**Grade Mode:** Letter Grade**NUTR 525 - Food and Culture in Italy****Credits:** 4

Students will be introduced to the Italian culture and its traditions, with a special focus on food. Part of the course will involve out-of-class activities and tasting experiences in the city of Ascoli Piceno, Italy. Only open to students studying abroad in the UNH-in-Italy Program. Permission required.

Attributes: World Cultures(Discovery)**Grade Mode:** Letter Grade**NUTR 530 - Critical Analysis in Food Studies****Credits:** 4

The course aims to investigate concepts and ideas that are essential to food studies. The philosophical aspects of the course are complemented by the experiential components that emphasize the particularity of the Italian environment. Only open to students studying abroad in the UNH-in-Italy Program. Permission required.

Attributes: Humanities(Disc)**Grade Mode:** Letter Grade**NUTR 535 - History of Food in Italy****Credits:** 4

Students will examine the history of food in Italy and explore the interconnected sociological, cultural, political and environmental histories. Only open to students studying abroad in the UNH-in-Italy Program. Permission required.

Attributes: Historical Perspectives(Disc)**Grade Mode:** Letter Grade**NUTR 546 - Nutrition in Exercise and Sports****Credits:** 4

Advanced nutritional strategies to optimize health, fitness, and athletic performance. Emphasis is on nutrition before, during, and after exercise for fitness, training, and competitions. Topics include healthy strategies for building muscle and losing body fat, as well as dietary manipulation in an effort to gain a competitive advantage. Prereq: NUTR 400 or equivalent.

Equivalent(s): NUTR 646**Grade Mode:** Letter Grade**NUTR 550 - Food Science: Principle and Practice****Credits:** 4

Application of scientific principles associated with the study of foods. Topics include: food composition, food additives and regulations, food safety, food biotechnology, product development and sensory evaluation. Principles of scientific inquiry as food ingredients are manipulated in a kitchen lab environment. Prereq: NUTR 400, HMGD 403 or NUTR 403, CHEM 411 or CHEM 403 and CHEM 404. Special fee. Lab.

Equivalent(s): NUTR 500, NUTR 501**Grade Mode:** Letter Grade**NUTR 560 - Introduction to Research in Nutrition****Credits:** 2

Introduction to research methods in nutritional assessment. Students gain both conceptual knowledge and hands-on experience in a collaborative setting while working with the College Health and Nutrition Assessment Project. Prereq: NUTR 400 or equivalent.

Grade Mode: Letter Grade**NUTR 595 - Mediterranean Diet and Culture****Credits:** 4

Is there a diet that allows one to eat, drink, and still be healthy? While Americans struggle with rising rates of obesity and related health conditions, inhabitants of the Mediterranean region enjoy relatively low rates of heart disease, cancer, and obesity. Offers a unique on-site experience in Ascoli Piceno, Italy to investigate the cultural and scientific importance of the Mediterranean Diet. Students review basic nutrition concepts as well as the history and evolution of the Mediterranean diet. Combining lecture, discussion, and experiential activities, NUTR 595 is offered through the UNH Italy Study Abroad Program during the summer session.

Co-requisite: INCO 589**Grade Mode:** Letter Grade

NUTR 600 - Field Experience in Nutrition**Credits:** 1-4

Supervised field experience in public and private agencies with planned learning objectives related to clinical and community nutrition and food service management. Students are responsible for their own transportation; faculty member coordinates arrangements with fieldwork sites. Prereq: NUTR 400 or equivalent. Cr/F.

Repeat Rule: May be repeated for a maximum of 6 credits.**Grade Mode:** Credit/Fail**NUTR 610 - Nutrition Education and Counseling****Credits:** 4

The principles, methods and materials needed to provide nutrition education and counseling services. Emphasis on motivational interviewing, behavior change and developing skills needed to be an effective nutrition educator and counselor. Prereq: NUTR 400 and NUTR 476.

Equivalent(s): NUTR 510**Grade Mode:** Letter Grade**NUTR 625 - From Farm to the Italian Table****Credits:** 4

Students will gain an appreciation for food production (harvesting, processing), culinary preparation, and tasting. Hands-on experience will be emphasized through field trips and will provide a broad, informed perspective on farming and sustainable agriculture. Only open to students studying abroad in the UNH-in-Italy Program. Permission required.

Grade Mode: Letter Grade**NUTR 628 - Culinary Nutrition Practicum****Credits:** 4

This course builds on basic cooking techniques learned in NUTR 403 with an emphasis on the study and use of whole food ingredients to prepare and critically evaluate healthy recipes/meals. Techniques such as recipe modification and menu development will be addressed. The course culminates with the development of a multi-course menu developed, prepared and presented by the students in the class.

Grade Mode: Letter Grade**NUTR 650 - Life Cycle Nutrition****Credits:** 4

Comprehensive review of the nutritional issues related to the life cycle. Nutrient requirements of each life cycle stage are analyzed in the context of their metabolic functions. Practical application of theory at each stage of the life cycle through projects and discussion. Prereq: NUTR 400 or equivalent. Recommended BMS 507 and BMS 508.

Grade Mode: Letter Grade**NUTR 686 - UNH-in-Italy Study Abroad****Credits:** 0

Provides a unique opportunity to study abroad in Ascoli Piceno, Italy during the semester. Open only to students studying abroad in the UNH-in-Italy Program. Permission required. Cr/F. Special fee.

Grade Mode: Credit/Fail**NUTR 699 - Independent Study****Credits:** 1-4

Scholarly research project in an area of the nutritional sciences under the guidance of a faculty adviser. May be repeated. Prereq: permission. Cr/F.

Repeat Rule: May be repeated for a maximum of 8 credits. May be repeated up to 4 times.**Equivalent(s):** NUTR 699W**Grade Mode:** Credit/Fail**NUTR 700 - Career Development in Dietetics****Credits:** 1

Preparation for applying to dietetic internship programs and/or graduate school. Topics include writing resumes and personal statements, interviewing, professional skills, and navigating the online internship application.

Grade Mode: Letter Grade**NUTR 709 - Nutritional Epidemiology****Credits:** 4

This course introduces basic concepts and methods in key areas of nutritional epidemiology, and discusses practical considerations related to designing, analyzing, and evaluating population-based nutrition studies. Research methods used in nutritional epidemiology will be taught to provide students with the ability to critically evaluate the nutritional epidemiological evidence. Learning will be enhanced by practical experiences in the collection, management, and analysis of nutritional epidemiological data during lab and in-class activities. Prereq: an introductory nutrition course and statistics course. Permission required.

Grade Mode: Letter Grade**NUTR 710 - Advanced Diabetes Care****Credits:** 2

Advanced Diabetes Care is a 2-credit course designed to build on foundational knowledge of diabetes care and education. During the semester, students will explore the pathophysiology of diabetes as well as modern medications and technology used to improve blood sugar management. Students will apply their knowledge of diabetes and nutrition to interpret data and deliver effective, compassionate care. Prereq: NUTR 400, BMS 507/BMS 508.

Grade Mode: Letter Grade**NUTR 720 - Community Nutrition****Credits:** 4

Identification of causes of complex public health nutrition problems (such as food insecurity and escalating obesity rates) and cost-effective community-based interventions required to solve them. Provides skills and tools needed to assess design, and evaluate community nutrition and wellness interventions. Prereq: NUTR 400 or equivalent. Writing intensive.

Attributes: Writing Intensive Course**Equivalent(s):** ANSC 610, ANSC 720**Grade Mode:** Letter Grade**NUTR 730 - From Seed to Sea: Examining Sustainable Food Systems****Credits:** 4

Integration of diverse human and natural system interactions in a seminar-based course to understand issues in food system sustainability. Examination of food system structure and function from coupled human and natural systems perspectives. Current and topical issues of food and agriculture include: exploration of using natural resources to meeting growing population demands; conflicting views on meeting food and nutrition requirements; impacts of increased stress on natural resources; inequities and discrimination in the food system; impact on dietary guidelines on the environment. Prereq: NUTR 400 or NUTR 405 or by permission.

Grade Mode: Letter Grade**NUTR 740 - Nutrition for Children with Special Needs****Credits:** 4

Nutritional assessment and care of children with special needs resulting in feeding difficulties requiring medical nutrition therapy. Prereq: NUTR 400.

Grade Mode: Letter Grade

NUTR 750 - Nutritional Biochemistry**Credits:** 4

Digestion, absorption, transport, and utilization of food nutrients. Role of macro- and micro-nutrients as substrates and catalysts for metabolic pathways, and the role of these pathways in maintaining human health at the cellular, organ, and whole body levels. Prereq: BMS 507 and BMS 508 or ANSC 511 and ANSC 512; BMCB 658 or equivalents. Writing intensive.

Attributes: Writing Intensive Course**Equivalent(s):** ANSC 750, ANSC 750W, NUTR 750W**Grade Mode:** Letter Grade**NUTR 751 - Nutritional Biochemistry of Micronutrients****Credits:** 4

Investigation of the nutritional and biochemical aspects of micronutrient metabolism. All essential vitamins and minerals, as well as some phytonutrients and quasi-nutrients, are explored in depth. Nutrients are examined for their molecular, cellular, metabolic and biomedical functions, as well as the biochemical and clinical consequences of their deficiency or excess. Prereq: NUTR 750 or equivalent.

Grade Mode: Letter Grade**NUTR 755 - Treatment of Adult Obesity****Credits:** 3

Overview of the risk factors associated with obesity; evidence-based recommendations for assessment and treatment of obesity. Counseling skills important to successful weight management and non-diet approaches are also explored. Prereq: NUTR 400, 476, and NUTR 610.

Co-requisite: NUTR 758**Equivalent(s):** NUTR 756**Grade Mode:** Letter Grade**NUTR 758 - Practicum in Weight Management****Credits:** 2

Assist clients in making lifestyle and dietary changes over a 10-week period and develop skills in marketing, advertising, counseling, an oral communication related to weight management. Prereq: NUTR 400 or equivalent; NUTR 476; and NUTR 610. Special fee.

Co-requisite: NUTR 755**Repeat Rule:** May be repeated for a maximum of 4 credits.**Equivalent(s):** NUTR 680**Grade Mode:** Letter Grade**NUTR #760 - Research Experience Nutrition I****Credits:** 2

Review scientific literature, formulation of research questions, testing hypotheses, analysis and interpretation of research data, and formal presentation of findings. Students gain conceptual knowledge and hands-on experience while working with established research projects. NUTR #760 focuses on the review of scientific literature and the development and testing of a research question. Prereq: NUTR 560.

Grade Mode: Letter Grade**NUTR #761 - Research Experience Nutrition II****Credits:** 2

Review scientific literature, formulation of research questions, testing hypotheses, analysis and interpretation of research data, and formal presentation of findings. Students gain conceptual knowledge and hands-on experience while working with established research projects. NUTR #761 focuses on understanding and communicating research findings in a collaborative setting. Prereq: NUTR #760.

Grade Mode: Letter Grade**NUTR #765 - Geriatric Nutrition****Credits:** 4

Overview of the physiological changes associated with aging and their impact on preparing, consuming, digesting, absorbing, and metabolizing food. Role of routine nutritional assessment in the promotion of health to prevent and manage chronic disease, with a social focus on the influence of polypharmacy on nutritional status. Prereq: NUTR 400 or equivalent; NUTR 650.

Grade Mode: Letter Grade**NUTR 773 - Clinical Nutrition****Credits:** 4

Principles and mechanisms of disease that result in altered nutrient requirements in humans. Prereq: NUTR 400; BMS 507 and BMS 508.

Equivalent(s): ANSC 773, ANSC 774, NUTR 774**Grade Mode:** Letter Grade**NUTR 775 - Practical Applications in Medical Nutrition Therapy****Credits:** 4

Combination of lecture and supervised practical experience in medical nutrition therapy in a New England hospital. Emphasizes nutritional counseling, assessment, and instruction of patients with nutrition-related disorders. Prereq: NUTR 400; BMS 507 and BMS 508 or ANSC 511 and ANSC 512; BMCB 658. Special fee.

Equivalent(s): ANSC 775**Grade Mode:** Letter Grade**NUTR 780 - Critical Issues in Nutrition****Credits:** 0 or 4

Critical review and analysis of controversial topics in nutrition; emphasis on developing oral and written communication skills and critical thinking skills. Writing intensive. Prereq: NUTR 773 or permission.

Attributes: Writing Intensive Course**Equivalent(s):** ANSC 780**Grade Mode:** Letter Grade**NUTR 790 - Undergraduate Teaching Experience****Credits:** 1-2

Assist graduate teaching assistants or faculty in preparing, presenting, and executing NUTR courses/laboratories.

Repeat Rule: May be repeated for a maximum of 4 credits.**Grade Mode:** Letter Grade**NUTR 795 - Investigations****Credits:** 1-4

Prereq: permission.

Equivalent(s): NUTR 795W**Grade Mode:** Letter Grade**NUTR 795W - Investigations****Credits:** 1-4

Prereq: permission. Writing intensive.

Attributes: Writing Intensive Course**Equivalent(s):** NUTR 795**Grade Mode:** Letter Grade**NUTR 799H - Honors Senior Thesis****Credits:** 1-4

A special project conducted under faculty supervision and resulting in a written honors thesis. Students must initiate discussion of the project with an appropriate faculty member. Prereq: Senior major with cum. GPA of 3.50; permission. Writing intensive.

Attributes: Honors course; Writing Intensive Course**Grade Mode:** Letter Grade

Sustainable Agriculture & Food Systems (SAFS)

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 Grade

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 Grade

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 Grade

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.

Attributes: Biological Science(Discovery); Discovery Lab Course

Equivalent(s): PLSC 421

Grade Mode: Letter Grade

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.

Grade Mode: Letter Grade

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 Grade

SAFS 510 - Agriculture and Development in the Neotropics

Credits: 4

Course is designed as a three week immersion into tropical agriculture and Costa Rican ecology and culture. Agriculture plays a pivotal role in Costa Rica's history and in shaping current events. Production of horticultural and agronomic crops occurs on a variety of scales ranging from large export based systems, to mid-sized operations for domestic sales, and sustenance based home gardens. Examples of all systems are visited and discussions focus on their overall sustainability. Sustainability is a broad concept and requires consideration of socio-cultural, environmental, and economic factors. Agriculture and agricultural products infuse the culture as seen by large participation in farmers markets and appreciation for a wide variety of fruits and vegetables prepared in myriads of ways. An appreciation for nature also infuses the culture and is embodied by the country's extensive system of national parks and protected reserves along with the national philosophy of 'Pura Vida'. Special fee.

Attributes: World Cultures(Discovery)

Grade Mode: Letter Grade

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.

Grade Mode: Letter Grade

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. Prereq: SAFS 415.

Grade Mode: Letter Grade

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**Grade Mode:** Credit/Fail**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.

Grade Mode: Letter Grade**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.

Grade Mode: Letter Grade**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 Grade**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, PBIO 651**Grade Mode:** Letter Grade**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**Grade Mode:** Letter Grade**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**Grade Mode:** Letter Grade**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**Grade Mode:** Letter Grade**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. Special Fee.

Co-requisite: INCO 588, SAFS 670, SAFS 671, SAFS 672**Grade Mode:** Letter Grade

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.

Grade Mode: Letter Grade**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.

Grade Mode: Letter Grade**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**Grade Mode:** Letter Grade**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**Grade Mode:** Letter Grade**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**Grade Mode:** Letter Grade**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**Grade Mode:** Letter Grade**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**Grade Mode:** Letter Grade**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.**Grade Mode:** Letter Grade

Faculty

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