

AGRICULTURE, NUTRITION AND FOOD SYSTEMS

<http://colsa.unh.edu/anfs>

Overview

The Department of Agriculture, Nutrition, and Food Systems offers programs designed for students interested in any of the broad range of exciting and challenging careers that are critical for providing current and future generations with adequate amounts of nutritious food through efficient, sustainable agriculture and food systems.

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 away programs including travel to Italy, Costa Rica and Ireland. Our graduates are well prepared for careers in the 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 (<http://catalog.unh.edu/archives/2017-2018/undergraduate/life-sciences-agriculture/programs-study/animal-science>)
- Equine Studies (<http://catalog.unh.edu/archives/2017-2018/undergraduate/life-sciences-agriculture/programs-study/equine-studies>)
- Nutrition (<http://catalog.unh.edu/archives/2017-2018/undergraduate/life-sciences-agriculture/programs-study/nutrition>)
- Sustainable Agriculture & Food Systems (<http://catalog.unh.edu/archives/2017-2018/undergraduate/life-sciences-agriculture/programs-study/sustainable-agriculture-food-systems>)

Courses

Animal Science (ANSC)

ANSC 401 - Animals and Society

Credits: 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; Biological Science GP 3B

ANSC 402 - Horsemanship

Credits: 3

For beginning, intermediate, and advanced riders. Lecture and lab (lesson) format. All levels will work on correct position for dressage and combined training with the integration of appropriate theory. All students are required to perform the following tasks independently: properly groom, tack and cool out their horses. Students should allow time before and after lab to do so. 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. There are other courses that provide students with opportunities for hands-on experience with horses. Students who exceed the weight limit for ANSC 402 are encouraged to contact Sarah Rigg at sarah.rigg@unh.edu to discuss other alternative courses. Special fee. May be repeated for a maximum of 15 credits. Lab. Prereq: permission.

ANSC 403 - Summer Horsemanship

Credits: 1

For beginning and intermediate riders. Basics of balance seat, specializing in basic dressage and combined training. There is no lecture with this summer course. Limited number of students may stable their horses at the University. Special fee. May be repeated for a maximum of 18 credits. Prereq: permission.

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.

ANSC 406 - Careers in Animal Science

Credits: 1

Survey of various areas of animal and veterinary science and opportunities available. Cr/F.

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.

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); Literature, Phil, Ideas GP 8**ANSC 421 - Animal Agriculture Today****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.

ANSC #444A - Animal Ethics: Your Child or Your Pet**Credits:** 4

Human attitudes toward other animals are generally divided into five categories: animal exploitation, animal use, animal welfare, animal rights, and animal liberation. While all five categories are examined, this course concentrates on the differences between animal welfare and animal rights. These two categories differ fundamentally on the basis of the ethical or moral status they give animals. Past human societies have justified both the worship of animals and the torture and sacrifice of animals to the gods. Animal rights believers rely on a rights-based philosophy, while animal welfare advocates concentrate on a utilitarian based set of values. Course concentrates on the application of these two ethical philosophies to current uses of animals such as the use of animals in research, the use of animals as food (factory farming), the production and use of transgenic animals, and the use of animals as organ donors for humans (xenotransplantation). Since animal rights is, in itself, not a discipline, students depend on information from other disciplines ranging from moral philosophy and ethics to history to genetics, production agriculture, and ethology. Writing intensive.

Attributes: Environment, Tech Society(Disc); Social Science GP 7; Inquiry (Discovery); Writing Intensive Course**ANSC #444B - Horse Power: Transforming and Reflecting Civilization****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 how its role in society? What does our use of the horse say about us as individuals and as a society? Writing intensive. Special fee.

Attributes: Humanities(Disc); Historical Perspectives GP 4; Inquiry (Discovery); Writing Intensive Course**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.

ANSC 504 - Equine Science**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.

ANSC 507 - Survey of Equine Training Techniques**Credits:** 3

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

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.

Attributes: World Cultures(Discovery); Foreign Culture GP 5; Writing Intensive Course**ANSC 511 - Anatomy and Physiology****Credits:** 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. No credit if credit earned for BMS 507 and BMS 508; ZOOL 518. Not open to freshmen.

ANSC 512 - Anatomy and Physiology**Credits:** 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. No credit if credit earned for BMS 507 and BMS 508. Not open to freshmen.

ANSC 520 - Classical Dressage Experience in Portugal**Credits: 2**

Concentrated study of the Portuguese method of classical dressage at L'Escola De Equitaco De Alcaínca 'N Alcaínca, Portugal. Affords students the opportunity to ride at a premiere center for equestrian art with a master of classical dressage and to experience the culture of Portugal. Offers full immersion in dressage riding, teaching, and training. Trip takes place over Spring Break. Weekly seminar held prior to departure. Special fee. Prereq: ANSC 402: Horsemanship at I-2 level or above. Permission required. May be repeated up to a maximum of 6 credits.

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

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. May be repeated to a maximum of 8 credit hours. Permission of supervising faculty member required. Cr/F.

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

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

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

ANSC 612 - Genetics of Domestic Animals**Credits: 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.

ANSC 615 - Dairy Farm Internship**Credits: 14**

An internship on a commercial dairy farm allowing the student day-to-day management of a herd of Holstein cows health and management (animal and financial) are studied. Homework and monthly exams. Dairy Management majors only. Permission required.

ANSC 620 - Equine Diseases**Credits: 4**

Provides an understanding of the normal versus the abnormal equine including recognition of clinical signs of the abnormal equine, diagnosis and treatment options. Knowledge of when to call a veterinarian and how to administer follow up care. Emphasis on preventative health care. Prereq: ANSC 504. Special fee. (Juniors and seniors only.)

ANSC 625 - Diseases of Small Ruminants, Swine, Poultry, and Camelids**Credits: 4**

This course focuses on concepts of health and disease as they relate to domestic small ruminants (goats and sheep), swine, poultry, and camelids (llamas and alpacas). Basic principles of disease diagnosis, transmission, treatment, and prevention are introduced and applied to specific disease conditions in these species. The course is divided into sections that focus on each group of animals and specific diseases are classified and taught based on the primary body system that is affected. Prereq: AAS 439, ANSC 511, ANSC 512.

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 402 at Intermediate 1 or above, or permission. Writing intensive.

Attributes: Writing Intensive Course

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.

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.

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 instructor certification process which is done as part of this course. Spring semester only, biannually, odd numbered years. Prereq: ANSC 640 and ANSC 500.

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. May be repeated to a maximum of 2 credits. Special fee.

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)

ANSC 694 - Summer Cooperative for Real Education in Agricultural Management**Credits:** 4

SCREAM (Summer Cooperative for Real Education in Agricultural Management) is a course in which students perform the work and make financial and 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 summer. SCREAM 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. Prereq: upper-class standing, permission.

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. May be repeated up to a maximum of 4 credits. Cr/F.

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.

ANSC 701 - Physiology of Reproduction**Credits:** 4

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

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.

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.

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.

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.

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.

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.

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**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.

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. May be repeated up to a maximum of 4 credits. Prereq: permission.

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. May be repeated up to a maximum of 4 credits. Prereq: permission. Writing intensive.

Attributes: Writing Intensive Course**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.

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.

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. May be repeated up to a maximum of 8 credits. Prereq: permission. IA. Writing intensive.

Attributes: Writing Intensive Course**Nutrition (NUTR)****NUTR 400 - Nutrition in Health and Well Being****Credits:** 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; Biological Science GP 3B**NUTR 400H - Honors/Nutrition in Health and Well Being****Credits:** 4

This course is designed to teach the scientific principles of human biology using nutritional concepts to promote personal health and well being. Special fee. Students cannot earn credit for this course if they have taken ANSC 400 or NUTR 475.

Attributes: Biological Science(Discovery); Discovery Lab Course; Biological Science GP 3B**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.

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); Social Science GP 7**NUTR 405W - Food and Society****Credits:** 4

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

Attributes: Social Science (Discovery); Social Science GP 7; Writing Intensive Course**NUTR 476 - Nutritional Assessment****Credits:** 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.

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.

NUTR 505 - ServSafe**Credits:** 1

Food safety training and certificate program administered by the National Restaurant Association. SevSafe certification required when working in a variety of food service establishments. Special fee.

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.

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); Foreign Culture GP 5

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); Literature, Phil, Ideas GP 8**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); Historical Perspectives GP 4**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.

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: HMG 403; NUTR 400; CHEM 411 or CHEM 403 and CHEM 404. Special fee. Lab.

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.

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.

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. May be repeated for a maximum of 6 credits. Cr/F.

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.

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.

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.

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.

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.

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.

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**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.

NUTR 733 - Inv Diet Supplements & Herbs**Credits: 4**

Investigations into the potential benefits to human health of medicinal herbs and other dietary supplements. Students critically evaluate the potential effectiveness of dietary supplements by relying on peer-reviewed nutrition and medical journals. Safety, efficacy, and legality of dietary supplements are critically evaluated, as well as governmental regulations and industry marketing approaches. Several exemplary dietary supplements are examined in detail. Recommended for students in the health sciences (nutrition, nursing, biomedical sciences). Students are expected to attend live sessions of this synchronous online course at the regularly scheduled class times, and all exams will take place in a UNH classroom at the regularly-scheduled class times on the dates indicated in the syllabus. Prereq: NUTR 400. Attributes: Online with some campus visits, EUNH.

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.

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

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.

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.

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.

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.

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.

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.

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; BMCB 658.

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.

NUTR 780 - Critical Issues in Nutrition**Credits: 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

NUTR 790 - Undergraduate Teaching Experience**Credits: 1-2**

Assist graduate teaching assistants or faculty in preparing, presenting, and executing NUTR courses/laboratories. May be repeated up to a maximum of 4 credits.

NUTR 795 - Investigations**Credits: 1-4**

Prereq: permission.

NUTR 795W - Investigations**Credits: 1-4**

Prereq: permission. Writing intensive. Attributes: Writing Intensive Course

NUTR 799 - 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. Offered both semesters. Prereq: Junior or Senior major with cum. GPA of 3.20; permission. Writing intensive. Attributes: Writing Intensive Course

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: Writing Intensive Course

Sustainable Agriculture & Food Systems (SAFS)

SAFS 405 - Sustainable Agriculture and Food Production**Credits:** 4

Introduces systems involved in sustainable agriculture with an emphasis on ecological and organic food production. Scientific and biological principles relating to sustainable and organic food production, and the role of sustainable agriculture within our communities. Special fee.

Attributes: Environment,TechSociety(Disc); Technology GP 3T**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); Foreign Culture GP 5**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.

SAFS 421 - Introductory Horticulture**Credits:** 4

Introduces horticultural practices and principles affecting plant growth and development in garden, landscape, greenhouse, and farm settings. Special fee. Lab.

Attributes: Biological Science(Discovery); Discovery Lab Course; Biological Science GP 3B**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.

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); Foreign Culture GP 5**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:** 1-4

A supervised experience providing the opportunity to apply academic knowledge in settings associated with future professional employment and/or related graduate opportunities. Must be approved by a faculty adviser selected by the student. May be repeated to a maximum of 8 credit hours. Permission required. Cr/F.

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 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 #642 - Team Experience in Agroecosystems Management (TEAM - Organic)**Credits: 4**

TEAM - Organic is a 2-semester experiential course where students are actively engaged in the operation of the COLSA/NHAES Organic Dairy Research Farm. Building on principles of agro-ecology and sustainable agriculture, students explore and practice the environmental, economic, social and production strategies needed for organic food production. Organic dairy farming methods and best practices are presented and applied. The organic food chain is addressed along with marketing and value-added strategies for organic dairy products. Instruction permission. Two semesters of SAFS #642 are required.

SAFS 651 - Plant Pathology**Credits: 4**

Nature, symptomatology, etiology, epidemiology, and control of important plant diseases. Prereq: BIOL 409, BIOL 411 and BIOL 412, or equivalent. Lab.

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

SAFS 729 - Agricultural Waste Management**Credits: 4**

The management of agricultural wastes is crucial in the development of sustainable agricultural practices. This course covers principles of managing, handling, treating, and applying animal manures and organic byproducts from an agricultural system perspective. Topics include waste characterization, descriptions of systems and technology, utilization of wastes as resources (land application, composting, electricity generation, fertilization, etc.), land application principles, preparations of waste management plans, and potential impacts to the environment. Prereq: SAFS 502 or permission of instructor.

SAFS #731 - Sustainable Landscape Design and Management**Credits: 4**

Students examine principles and trends in sustainable sites development and apply knowledge of ecological and biological systems in the design and maintenance of residential and commercial landscapes. Understanding woody plant structure and function and plant responses to environmental factors and horticultural practices are included as an integral part of sustainable landscape establishment. Each student completes a sustainable landscape renovation plan that creates an attractive human habitat and provides ecosystem services such as biodiversity and wildlife habitat, soil and water quality protection, nutrient recycling and microclimate modification. Prereq: SAFS 421.

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 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

SAFS 795 - Investigations**Credits: 1-4**

With faculty guidance, students work on individual projects related to sustainable agriculture and food systems. Permission required. May be repeated to a maximum of 8 credit hours.

SAFS 795W - Investigations**Credits: 1-4**

With faculty guidance, students work on individual projects related to sustainable agriculture and food systems. Permission required. May be repeated to a maximum of 8 credit hours. Writing intensive.

Attributes: Writing Intensive Course

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: Writing Intensive Course

Faculty

<http://colsa.unh.edu/faculty/all>