NFSC - NUTRITION AND FOOD SCIENCE

NFSC100 Elements of Nutrition (3 Credits)
Fundamentals of human nutrition. Nutrient requirements related to changing individual and family needs.
Credit Only Granted for: KNES264, KNES289F or NFSC100.

NFSC103 Nutrition and Sports Performance (3 Credits)
Nutrition and Sports Performance would give students a brief overview of positive health-related outcomes of a physically active lifestyle. Students would design a fitness regimen and be able to describe when and how glycogen, blood glucose, fat, and protein are used to meet energy needs during different types of physical activity. They would be able to differentiate between anaerobic and aerobic use of glucose, and identify advantages and disadvantages of each. This course would outline how to estimate and athlete's calorie need and discuss the general principles for meeting overall nutrient requirements in the training diet. The problems associated with rapid weight loss by dehydration and the importance of water and/or sports drinks during exercise would be examined. An understanding of the importance of staying well-nourished with carbohydrate, protein, and various vitamins and minerals before, during, and after training would be discussed.

NFSC112 Food: Science and Technology (3 Credits)
Introduction to the realm of food science, food technology and food processing. An overview of the largest industry in the U.S. with emphasis on the science of food and the technology of food preservation from harvest through processing and packaging to distribution and consumer utilization.

NFSC220 Diet: Is it a cause or a solution (3 Credits)
If diet is such a straightforward topic, then why and how does this simple matter result in complicated health problems? This course delves deeply into a Big Question at the intersection of diet and health. Diet is a topic that most people know but few people understand. In addition, diet has become one of the most important lenses for looking at a variety of social, economic, and cultural issues. Since the concept of diet is a continuum and has multifaceted aspects, we need to understand it from broad and multidisciplinary perspectives including social, cultural, and economic aspects.

NFSC298 Sports Nutrition Internship Practicum (1 Credit)
This internship allows students to gain hands on experience working in collegiate athletics. Students interact with an interdisciplinary team including registered dietitians, coaches, trainers, physicians and others to develop and enhance nutrition-related knowledge and skills. They also gain invaluable experience and exposure to the day-to-day duties of a collegiate sports dietitian. Students participate in a weekly 50-minute discussion that is held by two sports nutrition dietitians, and complete 9 hours per week hands on activities at Gossett Football Team House, Xfinity Center, and Varsity Team House.
Prerequisite: Must have completed or be concurrently enrolled in NFSC100; and permission of instructor; or students who have taken courses with comparable content may contact the department.
Repeatable to: 8 credits if content differs.

NFSC315 Nutrition During the Life Cycle (3 Credits)
A study of how development throughout life, including prenatal development, pregnancy, lactation, adolescence and aging, alter nutrient requirements. Students will apply this knowledge to the dietary needs and food choices of these different groups.
Prerequisite: Minimum grade of C- in NFSC100.

NFSC341 Fermented Food, Feed, and Pharmaceuticals (3 Credits)
Fermentation is a biochemical process that improves and preserves the organoleptic and nutritional values of various food and feed products. In addition, fermentation is a biotechnology tool which cultivates microorganisms or other raw materials into important pharmaceuticals and other industrial products. The objective of this course is to learn how fermented foods and feeds are produced and study the microbial starter cultures used in creating these probiotic-rich and functional foods. Fermentation techniques in animal feed production will be discussed in this course and the influence of these techniques on the nutritional requirements and digestive physiology of animals as well as the nutritive value of the feedstuffs will be studied. The process of production of pharmaceuticals such as antibiotics, enzymes and insulin and their applications will also be studied.
Prerequisite: AGST130; and CHEM271; or by permission of the instructor.
Jointly offered with: NFSC641.

NFSC350 Foodservice Operations (5 Credits)
Introduction to management. Responsibilities in quantity food production and purchasing in a foodservice operation. Laboratory experience in planning, preparation, and service of meals which meet the nutritional needs of the consumer.
Prerequisite: Minimum grade of C- in BSCI223 and BMGT364.
Restriction: Must be in Nutrition and Food Science: Dietetics program.

NFSC380 Methods of Nutritional Assessment (3 Credits)
Methods of assessing human nutritional status of populations and individuals. These methods include dietary, anthropometric, clinical evaluations and biochemical measurements.
Prerequisite: Minimum of C- in NFSC315 and BCHM461.
Restriction: Must be in Nutrition and Food Science: Food Science program.

NFSC386 Experiential Learning (3-6 Credits)
Prerequisite: Permission of AGNR-Nutrition and Food Science department.
Restriction: Junior standing or higher.
Formerly: FDSC386 and NUTR386.

NFSC388 Honors Thesis Research (3-6 Credits)
Undergraduate honors thesis research conducted under the direction of an AGNR faculty member in partial fulfillment of the requirements of the College of AGNR Honors Program. The thesis will be defended to a faculty committee.
Restriction: Must be admitted to AGNR Honors Program.
Repeatable to: 6 credits if content differs.

NFSC398 Seminar (1 Credit)
Presentation and discussion of current literature and research in food science.
Formerly: FDSC398.

NFSC399 Special Problems in Food Science (1-3 Credits)
Designed for advanced undergraduates. Specific problems in food science will be assigned.
Formerly: FDSC399.

NFSC412 Food Processing Technology (4 Credits)
Provides in-depth study of the major industrial modes of food preservation. It integrates aspects of the biology, microbiology, biochemistry and engineering disciplines as they relate to food processing technology and food science.
Prerequisite: CHEM241, CHEM242, NFSC431, NFSC414, and NFSC434.
Corequisite: NFSC421 and NFSC423.
Recommended: MATH120; or completion of MATH220 recommended.

NFSC414 Mechanics of Food Processing (4 Credits)
Applications in the processing and preservation of foods, of power transmission, hydraulics, electricity, thermodynamics, refrigeration, instruments and controls, materials handling and time and motion analysis.
Prerequisite: PHYS121.
Credit Only Granted for: ENBE414 or NFSC414.
Formerly: ENBE414.

NFSC416 Food Safety System (2 Credits)
Focuses on identifying and reducing biological, chemical and physical risks in food manufacturing and thereby reduce outbreak incidences and improve public health. The course is based on the US FDA recognized curriculum on 'Hazard Analysis and Risk Based Preventive Controls' (HARPC) regulations for manufacturing human foods. A successful completion of this course will result in students becoming 'preventive controls qualified individuals' as defined by the US FDA.
Restriction: Permission of AGNR-Nutrition and Food Science department.
Repeatable to: 0 credit.
Credit Only Granted for: NFSC498T, NFSC416, NFSC679T, or NFSC616.
Formerly: NFSC498T.

NFSC420 Nutritional Biochemistry (4 Credits)
This is a comprehensive course that integrates aspects of biochemistry, nutrition, and molecular biology. This course deals with (1) structure and function of biochemical macromolecules including carbohydrates, proteins, lipids, and nucleic acids; (2) transcriptional and translational regulation focusing on how gene expression is controlled at the level of transcription and translation, particularly in response to nutritional factors; (3) nutritional principles covering impact of digestion and absorption; (4) biochemical metabolism on emphasis of how the body processes nutrients and how metabolic pathways are regulated.
Prerequisite: NFSC315 and BCHM461.

NFSC421 Food Chemistry (3 Credits)
Basic chemical and physical concepts are applied to the composition and properties of foods. Emphasis on the relationship of processing technology to the keeping quality, nutritional value, and acceptability of foods.
Prerequisite: BCHM461.

NFSC422 Food Product Research and Development (3 Credits)
A capstone course for FDSC majors. A study of the research and development of new food products. Application of food technology, engineering, safety and packaging are integrated by teams of students to develop a new food product from concept to pilot plant scale-up. Students will travel to nearby food processing plants on two to four Saturdays during the semester.
Restriction: Senior standing; and must be in a major within AGNR-Nutrition and Food Science department; and permission of AGNR-Nutrition and Food Science department.
Formerly: FDSC422.

NFSC423 Food Chemistry Laboratory (3 Credits)
Analysis of the major and minor constituents of food using chemical, physical and instrumental methods in concordance with current food industry and regulatory practices. Laboratory exercises coincide with lecture subjects in NFSC421.
Prerequisite: Must have completed or be concurrently enrolled in NFSC421.

NFSC426 Current Topics in Nutrition and Chronic Disease (3 Credits)
Analysis of current topics related to diet, nutrition, and human health at cellular, molecular and biochemical level. Further, this course will provide overview of the current methods, and in vitro and in vivo model systems used in nutrition research. Syllabus includes topics relevant to dietary regulation of genes/proteins and their impact on both physiological and pathological conditions including hyperlipidemia, hyperglycemia, fibrosis, food allergy, nutraceuticals, inflammatory diseases (IBD), cardiovascular diseases (atherosclerosis and stenosis), and oncogenesis. This course is designed to help students to understand and apply current scientific concepts and research methods, and to obtain necessary skills in evaluation and interpretation of evidence based scientific data.
Jointly offered with: NFSC621.
Credit Only Granted for: NFSC498F, NFSC426, NFSC678F, or NFSC621.
Formerly: NFSC498F.

NFSC427 Current Topics on Diet, Gut Microbiota Health and Metabolic Disease (3 Credits)
A review of current science linking the gut microbiota/microbiome with general and public health. It covers the composition of a healthy gut microbiota, its acquisition, how it is studied and analyzed; Gut microbiota changes with diet, specific foods, immigration and globalization and exercise; Its links to obesity, liver disease, insulin resistance and diabetes and cardiovascular disease; Links to the immune system; Targeting the gut microbiota composition and function to protect against or treat metabolic diseases. This course will be of use to public health and health care professionals, Food and/or Nutrition scientists, Dieticians, and those generally interested in understanding the health relevance of news reports or scientific reports on the microbiome.
Recommended: BCHM461.
Jointly offered with: NFSC627.
Credit Only Granted for: NFSC678K, NFSC498K, NFSC427, or NFSC627.
Formerly: NFSC498K.

NFSC430 Food Microbiology (3 Credits)
A study of microorganisms of major importance to the food industry with emphasis on food-borne outbreaks, public health significance, bioprocessing of foods, disease control, and the microbial spoilage of foods.
Prerequisite: BSCI223; or permission of instructor.
Credit Only Granted for: ANSC430 or NFSC430.
Formerly: FDSC430.

NFSC431 Food Quality Control (4 Credits)
Definition and organization of the quality control function in the food industry; preparation of specifications; statistical methods for acceptance sampling; in-plant and processed product inspection. Instrumental and sensory methods for evaluating sensory quality, identity and wholesomeness and their integration into grades and standards of quality. Statistical Process Control (SPC).

NFSC434 Food Microbiology Laboratory (3 Credits)
A study of techniques and procedures used in the microbiological examination of foods.
Prerequisite: Must have completed or be concurrently enrolled in NFSC430.
Credit Only Granted for: NFSC434 or ANSC434.
Formerly: FDSC434.

NFSC436 Diet and Optimal Human Health (3 Credits)
Focuses on maintaining optimal health and preventing diseases in humans with attention to diet. Reviews the main causes (nutritional/ behavioral/lifestyle/ environmental/genetic factors) of diseases and nutrient needs, sources, functions and interactions, and deals with the benefits of healthy diets and nutraceutical/pharmaceutical option on human health. The emphasis will be on developing conceptual knowledge, critical thinking and problem solving skills and the application of nutrition in the health promotion.
Prerequisite: NFSC100, BSCI170, and BSCI171 .
Jointly offered with: NFSC636.
Credit Only Granted for: NFSC498L, NFSC678L, NFSC436, or NFSC636.
Formerly: NFSC498L.

NFSC440 Advanced Human Nutrition (4 Credits)
A critical study of physiologic, molecular and metabolic influences on utilization of carbohydrates, lipids, proteins, vitamins, macro-and micro-minerals, and nonnutritive components of food. Interactions of these nutrients and food components will be examined relative to maintaining health.
Prerequisite: Minimum of C- in NFSC100, BCHM462 and BSCI440.

NFSC450 Food and Nutrient Analysis (3 Credits)
Methods and practices of the analysis of foods and nutrients. An overview of the principles and basic mechanisms used in many of the analytical procedures commonly used in food and nutrition research. Emphasis will be placed on hands-on development of skills necessary to complete each analytical procedure; and on the accurate and concise description of the methodology and results from their application and on the regulations governing food analysis for nutritional labeling.
Prerequisite: BCHM461 and NFSC100.
Formerly: NUTR450.

NFSC455 Medical Nutrition Therapy I (4 Credits)
Advanced clinical nutrition course for dietetics or nutrition science majors. Modifications of the normal adequate diet to meet human nutritional needs in acute and chronic diseases and metabolic disorders. Includes energy balance and weight management, nutritional genomics, nutrition counseling, autoimmune disease, nutrition for pediatric conditions.
Prerequisite: NFSC380.
Corequisite: NFSC440.

NFSC456 Medical Nutrition Therapy II (4 Credits)
Modifications of the normal adequate diet to meet human nutritional needs in acute and chronic diseases and metabolic disorders.
Prerequisite: Minimum of C- in NFSC380 and NFSC440; and permission of AGNR-Nutrition and Food Science department.

NFSC470 Community Nutrition (3 Credits)
Perspectives underlying the practice of nutrition services in community settings. Assessment of needs, program planning and evaluation. Programs and strategies to meet nutrition needs outside the acute care setting, such as nutrition education and food assistance. National nutrition policy and federal initiatives in nutrition will be examined. Students will be required to travel to local community nutrition sites during the semester.
Prerequisite: Minimum of C- in NFSC315.

NFSC490 Special Problems in Nutrition (2-3 Credits)
Individually selected problems in the area of human nutrition.
Prerequisite: NFSC440; and permission of AGNR-Nutrition and Food Science department.

NFSC491 Professional Issues and Opportunities in Dietetics (3 Credits)
A capstone course for dietetics majors. Students will integrate knowledge and theory of nutrition, food, management, psychology, and social behaviors necessary to support quality dietetic practice. Working in teams, students will participate in case studies, simulated situations and community projects. Individuals and groups will present cases as well as papers on published research.
Prerequisite: Minimum of C- in NFSC350 and permission of Nutrition and Food Science Dietetics program.
Corequisite: NFSC456.
Restriction: Senior standing or higher; and must be in Nutrition and Food Science: Dietetics program.

NFSC498 Selected Topics (1-3 Credits)
Selected current aspects of food.
Restriction: Permission of AGNR-Nutrition and Food Science department.
Repeatable to: 6 credits if content differs.