

# HUMAN NUTRITION, FOODS, AND EXERCISE

Our Website (<http://www.hnfe.vt.edu>)

## Overview

Human Nutrition, Foods, and Exercise (HNFE) is a unique department that examines aspects of human health, including psychosocial aspects of health, behavioral intentions, human movement and performance, and weight management with a focus on chronic disease and prevention. The curriculum builds on the biological, physical, and social sciences. Many health issues including obesity, heart disease, and cancer have been associated with a person's food intake and level of exercise. This has led to increasing emphases on health promotion and disease prevention, and nutrition and exercise professionals are integral members of the health care team. Additionally, students prepared in these content areas are sought after by healthcare professional programs such as nutrition and dietetics, physical therapy, occupational therapy, physician assistant, medicine, athletic training, pharmacy, dentistry, nursing etc. Expanding research by private and government agencies focusing on the role of nutrition and physical activity in health, growth, and aging has created a demand for graduates at the Bachelor of Science (B.S.), Master of Science (M.S.), and Doctor of Philosophy (Ph.D.) levels who have a background and interest in laboratory and experimental methods in nutrition, foods and exercise science. Faculty and staff in HNFE include interdisciplinary teams that work towards molecular and clinical advances for the prevention and improved treatment of chronic diseases, behavioral discoveries that lead to effective intervention programs for youth and adults and speed the movement from research to practice.

Undergraduate students earn a Bachelor of Science degree in Human Nutrition, Foods, and Exercise with a major in Exercise and Health Sciences and/or Nutrition and Dietetics.

The department participates in the university's Honors Program.

HNFE offers master's and doctoral degrees in specialized areas as they relate to nutrition, physical activity, and health. Graduate students may earn a M.S. or a Ph.D. in HNFE with an emphasis in Molecular and Cellular Science, Clinical Physiology and Metabolism, or Behavioral and Community Science. HNFE also offers a M.S. in Nutrition and Dietetics. Completion of the M.S. in Nutrition and Dietetics leads to eligibility to become a Registered Dietitian Nutritionist (RDN).

## Exercise and Health Sciences (EAHS)

**Consult: Renee Eaton, Undergraduate Program Director**

Students in the Exercise and Health Sciences (EAHS) major are well-prepared for graduate work in many areas of nutrition, exercise physiology, or related sciences. This major also meets admission requirements for medical, dental, physical therapy, pharmacy, physician assistant, athletic training, nursing, and other health professions programs. Flexibility to tailor the degree toward individual long-term goals, including continued education in a health profession or employment, is a key feature of the major. Students who enter the workforce have position titles such as patient care coordinator, clinical technician, fitness and health program coordinator, clinical research coordinator, medical scribe, surgical technician, rehabilitation aide, hospital recruiting specialist, exercise physiologist, health coach, strength and conditioning coach, hospital credentialing specialist,

medical device sales associate, and health educator. Students in this major gain knowledge, skills, and abilities specified by the American College of Sports Medicine for certification as an Exercise Physiologist and Clinical Exercise Physiologist as well as the National Strength and Conditioning Association for certification as a Strength and Conditioning Specialist. With the growing attention to the role of nutrition and exercise in health promotion and disease prevention, the EAHS major is especially appropriate for the student preparing for a career in medicine, physical therapy, or a related health field. Most students in the EAHS plan to attend graduate or professional school. Students in the EAHS major must maintain an overall GPA of 2.5 to remain in the major. Please see the Satisfactory Progress section for additional requirements.

Students in the EAHS major do not meet the ACEND® requirements for a degree in dietetics, and therefore do not earn a DPD Verification Statement. Students, however, may choose to major in both EAHS and Nutrition and Dietetics.

## Nutrition and Dietetics (NAD)

**Consult: Heather Cox, Director, Didactic Program in Dietetics**

The Nutrition and Dietetics (NAD) major is a Didactic Program in Dietetics (DPD), fully accredited by the Accreditation Council for Education in Nutrition and Dietetics (ACEND®). ACEND® is the education program accrediting agency of the Academy of Nutrition and Dietetics and is recognized by the U.S. Department of Education as a Title IV gatekeeper. Following completion of the B.S. degree, a student will have earned an ACEND® DPD Verification Statement. A student must then complete a graduate degree and an ACEND®-accredited supervised practice program in nutrition and dietetics to be eligible for the Registration Examination for Dietitians. Examples of eligible pathways to the RDN credential include a graduate dietetics program or graduate program completed before, or along with, a dietetic internship. Graduates from the NAD major are competitive applicants for the varied ACEND®-accredited supervised practice programs.

Nutrition and Dietetics students are also eligible to apply to the accelerated track of the HNFE Master of Science in Nutrition and Dietetics in the spring semester before they begin their final academic year. Accepted students are dual enrolled in the B.S. and M.S. programs and complete eligibility to take the board exam to become a Registered Dietitian Nutritionist (RDN) in an accelerated route.

The NAD major prepares graduates to assume a professional role in health care, research, the business/industry environment, public health, and to pursue graduate studies. Most alumni pursue a supervised practice program and become an RDN. Clinical RDNs in hospitals and outpatient clinics provide care to individuals with disease-related nutritional problems. Sports RDNs work with professional sports teams or university sports teams. Community RDNs work in cooperative extension, worksite wellness programs, and community programs serving mothers and children, families of low-income, or older individuals. Business focused RDNs work for food and grocery companies, companies manufacturing nutritional supplements, and may represent medical or health products. Administrative RDNs with management interests find positions in management in a variety of settings such as school nutrition, health care facilities, college or university dining, or hotels and resorts. Registered Dietitians Nutritionists counsel clients of all ages, cultural and ethnic backgrounds, and levels of education.

Students in the NAD major must maintain an overall GPA of 3.0 to remain in the major. Students who want to change their major into NAD must

have an overall GPA of 3.0. Please see the Satisfactory Progress section for additional requirements.

## Satisfactory Progress

A student in HNFE will be considered to have made satisfactory progress toward the degree when they have successfully completed:

- Overall GPA 3.0 or higher (NAD) or 2.5 or higher (EAHS)
- Grade of C or better in HNFE 1004 Foods, Nutrition And Exercise
- Grade of C- or better in CHEM 1036 General Chemistry, CHEM 1036 General Chemistry, and CHEM 2535 Organic Chemistry or CHEM 2514 Survey of Organic Chemistry.
- These courses must be completed by the time the student has attempted 72 hours:
  - BIOL 1105 Principles of Biology-BIOL 1106 Principles of Biology or equivalent
  - CHEM 1035 General Chemistry-CHEM 1036 General Chemistry or equivalent
  - CHEM 2535 Organic Chemistry or CHEM 2514 Survey of Organic Chemistry
  - HNFE 1004 Foods, Nutrition And Exercise

Students not meeting Satisfactory Progress will have one probationary semester in which to resolve their standing.

**Nutrition and Dietetics Restricted Major status:** Current Virginia Tech students who wish to change majors to NAD (or add it as a second major) are required to have an overall GPA at or above 3.0, a grade of C- or higher in CHEM 1035 General Chemistry, and a plan of study that shows appropriate course sequencing and Satisfactory Progress. The GPA threshold of 2.5 (EAHS) and 3.0 (NAD) is required for all students regardless of transfer status. Satisfactory progress towards the B.S. degree is enforced.

- Exercise and Health Sciences Major (<https://catalog.vt.edu/undergraduate/agriculture-life-sciences/human-nutrition-foods-exercise/human-nutrition-foods-exercise-bs-science-food-nutrition-exercise/>)
- Nutrition and Dietetics Major (<https://catalog.vt.edu/undergraduate/agriculture-life-sciences/human-nutrition-foods-exercise/human-nutrition-foods-exercise-bs-dietetics/>)

**Head:** Stella L. Volpe

**Professors:** G. Davis, B. Davy, K. Davy, R. Grange, E. Larson-Meyer, D. Liu, E. Serrano, E. Schmelz, S. Volpe, and J. Williams

**Associate Professors:** D. Good, S. Harden, Y. Ju, and V. Kraak

**Assistant Professors:** J. Basso, S. Craigie, A. DiFeliceantonio, J. Drake, V. Hedrick, C. Rafie, S. Shin, and J. Stein

**Collegiate Associate Professor:** A. Anderson

**Senior Instructors:** H. Cox, N. Girmes-Grieco, and C. Papillon

**Advanced Instructor:** R. Eaton

**Instructors:** K. Chang and A. LaFalce

**Adjunct Instructors:** M. Rockwell, A. Steketee

**Academic Advisors:** E. Engel, S. Nelson, D. Pollio, and K. Wogenrich

## Undergraduate Course Descriptions (HNFE)

### HNFE 1004 - Foods, Nutrition And Exercise (3 credits)

Scientific information applied to current concerns in foods, nutrition and exercise as it affects the nutritional health well-being of humans. I,II

**Instructional Contact Hours:** (3 Lec, 3 Crd)

### HNFE 1114 - Orientation to HNFE (1 credit)

An introduction to the academic and career planning for students in the Human Nutrition, Foods & Exercise major.

**Instructional Contact Hours:** (1 Lec, 1 Crd)

### HNFE 1214 - Topics in Lifetime Activities (1 credit)

Participation in physical activity, fitness assessment, motor skill development. Awareness and development of the physical, spiritual, emotional, social, and intellectual components of wellness. Application of healthy lifestyle choices for improved quality of life. May be repeated with varying content, for a maximum of 6 credits. Pass/Fail Only

**Instructional Contact Hours:** (3 Lab, 1 Crd)

**Repeatability:** up to 6 credit hours

### HNFE 1215 - Meraki Living Learning Community, Be Well, Be You (1 credit)

Introduces students in the Meraki Living Learning Community to six dimensions of well-being: purpose, social, financial, community, physical, and emotional. Classroom learning, guided practice, connection to well-being resources, and individual exploration to promote lifelong holistic health and well-being. Personal well-being focused on developing a concept of self, understanding purpose, and learning positive health behaviors to support physical activity, nutrition, mindfulness, and personal finance.

**Instructional Contact Hours:** (1 Lec, 1 Crd)

### HNFE 1216 - Meraki Living Learning Community, Be Well, Be You (1 credit)

Introduces students in the Meraki Living Learning Community to six dimensions of well-being: purpose, social, financial, community, physical, and emotional. Classroom learning, guided practice, and individual exploration to promote lifelong holistic health and well-being. Community well-being focused on mental health initiatives, student leadership, developing and sustaining relationships, and service.

**Prerequisite(s):** HNFE 1215

**Instructional Contact Hours:** (1 Lec, 1 Crd)

### HNFE 1804 - Principles of Sport Science (3 credits)

Introduction to the principal concepts of improving human physical capacity through sport, exercise training and diet. Emphasis on critical thinking and evidence-based decision making in describing the limits to human performance, responses, adaptations, and health benefits of exercise.

**Instructional Contact Hours:** (3 Lec, 3 Crd)

### HNFE 1984 - Special Study (1-19 credits)

**Instructional Contact Hours:** Variable credit course

### HNFE 2004 - Professional Dietetics (1 credit)

Introduction to the profession of dietetics with emphasis on competencies, preparation, and responsibilities associated with dietetic practice. Overview of the structure of The American Dietetic Association (ADA) and its relationship to the dietetic professional. Discussion of current professional concerns. II

**Corequisite(s):** HNFE 2014

**Instructional Contact Hours:** (1 Lec, 1 Crd)

**HNFE 2014 - Nutrition Across the Life Span (3 credits)**

Nutritional requirements and related health concerns of pregnant and lactating women, infants, children, adults and the elderly are studied in relation to the physiological and metabolic aspects of pregnancy, lactation, growth and development, maintenance of health, prevention of disease, and aging. 1 year of biology or chemistry required. CHEM 1056 may be substituted for co-requisite CHEM 1036.

**Prerequisite(s):** HNFE 1004

**Corequisite(s):** CHEM 1035

**Instructional Contact Hours:** (3 Lec, 3 Crd)

**HNFE 2014H - Nutrition Across the Life Span (3 credits)**

Nutritional requirements and related health concerns of pregnant and lactating women, infants, children, adults and the elderly are studied in relation to the physiological and metabolic aspects of pregnancy, lactation, growth and development, maintenance of health, prevention of disease, and aging. 1 year of biology or chemistry required. CHEM 1056 may be substituted for co-requisite CHEM 1036.

**Prerequisite(s):** HNFE 1004

**Corequisite(s):** CHEM 1035

**Instructional Contact Hours:** (3 Lec, 3 Crd)

**HNFE 2104 - Moving Body, Moving Mind (3 credits)**

Methods of working intentionally towards cultivating optimal brain states. Mind/body practices to develop connections between contemporary neuroscience, movement, and meditative practices. Studies in the intersection of consciousness, movement, and thought. Introduction to yoga, meditation, authentic movement, experiential anatomy, and somatic work. Emphasis on holistic perspectives of the body through active listening, ethical reasoning, healthy self-image, and attention to the practices of intentional embodiment.

**Pathway Concept Area(s):** 6A Critique & Practice in Arts, 10 Ethical Reasoning

**Instructional Contact Hours:** (3 Lec, 3 Crd)

**Course Crosslist:** DANC 2104

**HNFE 2204 - Medical Terminology (3 credits)**

Structure, pronunciation, and use of medical terms; anatomical structures and body systems; terms used in pathology, testing, diagnosis, surgery, pharmacology and treatment.

**Prerequisite(s):** (BIOL 1005 or BIOL 1105 or BIOL 1205H) and (BIOL 1006 or BIOL 1106 or BIOL 1206H) or ISC 2105

**Instructional Contact Hours:** (3 Lec, 3 Crd)

**HNFE 2254 - Exercise Leadership - Group Fitness Instructor (3 credits)**

Development of theoretical and practical skills for leading exercise in a group setting. Topics include: general guidelines for instructing safe, effective, and purposeful exercise, essentials of the instructor-participant relationship, the principles of motivation to encourage adherence in the group fitness setting, effective instructor-to-participant communication techniques, methods for enhancing group leadership, and the group fitness instructors professional role. Obtain knowledge of programming for multiple populations. Will complete a CPR and AED certification as a part of in-class instruction. Pass/Fail only.

**Instructional Contact Hours:** (2 Lec, 3 Lab, 3 Crd)

**HNFE 2264 - Exercise Leadership- Personal Trainer (3 credits)**

Development of practical skills for conducting one-on-one exercise sessions for general healthy adults and special populations. Exercise selection, testing, training principles, and behavioral change skills required to be an effective personal trainer. Preparation for a nationally accredited personal training certification. CPR and AED certification. Pass/Fail only.

**Instructional Contact Hours:** (2 Lec, 3 Lab, 3 Crd)

**HNFE 2274 - Wilderness First Responder (3 credits)**

Assessment and treatment of emergencies in remote settings. Anatomy, physiology, and pathophysiology, personal and group safety and hygiene, patient assessment and documentation of treatment for trauma, medical emergencies, environmental emergencies, and long-term care. Team management of medical emergencies in wilderness context, organization and implementation of rescues, decision-making, leadership, judgment, and prevention. Prepares students to successfully complete a national certification exam. Pass/fail only.

**Instructional Contact Hours:** (2 Lec, 3 Lab, 3 Crd)

**HNFE 2314 - Active Transportation for a Healthy, Sustainable Planet (3 credits)**

Connections among active transportation (e.g., bicycling, walking) and significant global challenges such as physical inactivity, health, the environment, and the economy on local to global scales. Methods to assess walkability among communities with different worldviews and the influence of the built environment on rates of active transportation. Approaches to evaluate demographic and psychosocial predictors and physical and policy barriers to use of active transportation. Successful strategies to increase active transportation through community design guidelines, behavior change tools, transportation planning, and policy.

**Pathway Concept Area(s):** 3 Reasoning in Social Sciences, 11 Intercultural&Global Aware.

**Instructional Contact Hours:** (3 Lec, 3 Crd)

**Course Crosslist:** SPIA 2314

**HNFE 2334 - Introduction to Integrative Health (3 credits)**

Introduction to the principles of integrative health that promote health and well-being. Examination of the person-centered integrative health treatment methods including holistic stress management, the human spirit, communication, energy healing, elements of meditation, healing environments, Chinese medicine, Ayurvedic medicine, voice work, nutrition, therapeutic massage and bodywork, and healing effects of physical activity. Review of scientific evidence of integrative treatments.

**Instructional Contact Hours:** (3 Lec, 3 Crd)

**HNFE 2484 - Evidence-Based Practice in Health Science (1 credit)**

Evidence-based practice in the field of health science. Utilization and evaluation of published research in literature. Answers to health and healthcare related questions. Identification of well-defined research questions using current frameworks. Best practices of healthcare policies.

**Prerequisite(s):** HNFE 1004

**Corequisite(s):** HNFE 2014

**Instructional Contact Hours:** (1 Lec, 1 Crd)

**HNFE 2544 - Functional Foods for Health (3 credits)**

Introduction to functional foods (foods with additional value beyond basic nutrition) including development of functional foods, novel sources, and traditional foods with value-added health benefit; regulatory issues; and media messages.

**Instructional Contact Hours:** (3 Lec, 3 Crd)

**Course Crosslist:** FST 2544

**HNFE 2664 - Behavioral Theory in Health Promotion (3 credits)**

Introduction to behavioral theories used to design, implement and evaluate health promotion programs, and theories underlying health behavior change. Interactions between individuals, physical and social environments, interpersonal, and intrapersonal determinants of health behavior. Epidemiological evidence of benefits of healthful eating and physical activity.

**Pathway Concept Area(s):** 3 Reasoning in Social Sciences, 11 Intercultural&Global Aware.

**Instructional Contact Hours:** (3 Lec, 3 Crd)

**HNFE 2774 - Topics in HNFE (1-3 credits)**

A variable-content course. Explores significant contemporary topics in the areas of nutrition, foods, exercise and health. May be repeated for up to six credits.

**Prerequisite(s):** HNFE 1004

**Instructional Contact Hours:** (1-3 Lec, 1-3 Crd)

**Repeatability:** up to 6 credit hours

**HNFE 2804 - Exercise and Health (3 credits)**

Introduction to the foundations of exercise science as applied to healthy living, and the concept of exercise as medicine. Fundamentals of health appraisal, foundations of fitness training principles and prescription; nutrition and energy cost, and application of exercise prescription for disease prevention and treatment.

**Prerequisite(s):** HNFE 1004 and BMSP 2135

**Instructional Contact Hours:** (3 Lec, 3 Crd)

**HNFE 2824 - Prevention and Care of Athletic Injuries (2 credits)**

An introduction to the techniques and principles of athletic training. I,II.

**Instructional Contact Hours:** (1 Lec, 3 Lab, 2 Crd)

**HNFE 2954 - Study Abroad (1-19 credits)**

**Instructional Contact Hours:** Variable credit course

**HNFE 2964 - Field Work/Practicum (1-19 credits)**

**Instructional Contact Hours:** Variable credit course

**HNFE 2974 - Independent Study (1-19 credits)**

**Instructional Contact Hours:** Variable credit course

**HNFE 2984 - Special Study (1-19 credits)**

**Instructional Contact Hours:** Variable credit course

**HNFE 2984A - Special Study (1-19 credits)**

**Pathway Concept Area(s):** 1A Discourse Advanced

**Instructional Contact Hours:** Variable credit course

**HNFE 2984N - Special Study (1-19 credits)**

**Pathway Concept Area(s):** 1F Discourse Foundational

**Instructional Contact Hours:** Variable credit course

**HNFE 2994 - Undergraduate Research (1-19 credits)**

**Instructional Contact Hours:** Variable credit course

**HNFE 3024 - Science of Food Prep Lab (2 credits)**

Application of the principles of food science and food preparation techniques related to health promotion, disease prevention, and disease management. Selection, production, and evaluation of foods and beverages. Emphasis on experimentation illustrating chemical and physical reactions, sensory and physical properties, nutrient manipulation, cooking applications, and functions of foods.

**Prerequisite(s):** (HNFE 1004 and CHEM 1036) or CHEM 1056 or (ISC 2106 and FST 2014)

**Instructional Contact Hours:** (1 Lec, 3 Lab, 2 Crd)

**HNFE 3034 - Methods of Human Health Assessment (2 credits)**

Evidence-based practice in areas of human health assessment including: anthropometric measurements, vital signs, body composition, aerobic capacity, muscular strength, energy requirements, and health behaviors. Comparison and analysis of assessment methods.

**Prerequisite(s):** (HNFE 2014 or HNFE 2014H) and BMSP 2136

**Instructional Contact Hours:** (1 Lec, 3 Lab, 2 Crd)

**HNFE 3114 - Foodservice and Meal Management (4 credits)**

Foodservice and meal management for the dietetics professional. Emphasis is placed on understanding food procurement, production, distribution, and marketing in a safe and well managed operation. I

**Prerequisite(s):** HNFE 3024 or HNFE 2224

**Instructional Contact Hours:** (3 Lec, 3 Lab, 4 Crd)

**HNFE 3224 - Communicating with Food (3 credits)**

Development of oral and written communication skills to communicate food and nutrition information to diverse populations. II

**Prerequisite(s):** (HNFE 2014 or HNFE 2014H) and (HNFE 3024 or HNFE 2224)

**Instructional Contact Hours:** (2 Lec, 3 Lab, 3 Crd)

**HNFE 3634 - Epidemiologic Concepts of Health and Disease (3 credits)**

Designed to give students in the health sciences a basic understanding of the modern concepts regarding health and disease as well as skills in organizing epidemiological data, disease investigation and surveillance. Includes a survey of terms, concepts, and principles pertinent to epidemiology. Lifestyles of populations and the relationships between lifestyles and health status are studied.

**Prerequisite(s):** STAT 2004 or STAT 3005 or STAT 3604 or STAT 3615

**Instructional Contact Hours:** (3 Lec, 3 Crd)

**Course Crosslist:** PHS 3634

**HNFE 3804 - Exercise Physiology (3 credits)**

Effects of exercise on physiology: neuromuscular, metabolic, cardiopulmonary. Scientific basis of physical training. I

**Prerequisite(s):** BMSP 2136 and HNFE 2804

**Instructional Contact Hours:** (3 Lec, 3 Crd)

**HNFE 3824 - Kinesiology (3 credits)**

The anatomical and biomechanical basis of human motion, with applications for motor skill acquisition, and development and rehabilitative exercises. I

**Prerequisite(s):** BMSP 2135 and BMSP 2136

**Corequisite(s):** PHYS 2205 or PHYS 2305.

**Instructional Contact Hours:** (3 Lec, 3 Crd)

**HNFE 3954 - Study Abroad (1-19 credits)**

**Instructional Contact Hours:** Variable credit course

**HNFE 3984 - Special Study (1-19 credits)**

**Instructional Contact Hours:** Variable credit course

**HNFE 4004 - Seminar in HNFE: Writing and Discourse in the Major (3 credits)**

Focused review of relevant and current literature in selected areas of food, nutrition and exercise. Develop practical strategies for finding research articles on specific topics utilizing a variety of search tools (e.g., library, on-line search engines, etc.). Develop analytical skills to critically assess the significance of published research data. Develop competence in written and verbal presentation of current research in formats suitable for a scientific or a lay audience.

**Prerequisite(s):** COMM 2004 or ALCE 3634 and HNFE 2484

**Corequisite(s):** HNFE 4025

**Instructional Contact Hours:** (3 Lec, 3 Crd)

**HNFE 4024 - Emerging Issues in Dietetics (1 credit)**

Investigation of emerging dietetics topics including professional development, new technologies, current legislative issues, and promising evidence-based practice strategies. Integration of knowledge from previous courses to support quality dietetics practice will be emphasized.

**Prerequisite(s):** HNFE 4026

**Corequisite(s):** HNFE 4125

**Instructional Contact Hours:** (1 Lec, 1 Crd)



**HNFE 4025 - Metabolic Nutrition (3 credits)**

4025: Study of bioenergetics and macronutrients, with emphasis on sources, interrelationships, and factors affecting utilization and metabolism. Emphasis on how carbohydrates, lipids, and proteins are metabolized following a meal, during fasting conditions, and when exercising. How metabolism of carbohydrates, lipids and proteins affects and is effected by metabolic disease such as obesity and diabetes will also be examined. 4026: Study of essential vitamins and minerals and their interaction with body systems, especially as these relate to food, exercise and health. Emphasis on how deficiency, toxicity and genetic conditions affect various organ systems, including bone, skin, digestive, and blood. Historical and regulatory policies, and scientific studies establishing recommended dietary allowances for micronutrients are considered.

**Prerequisite(s):** (HNFE 2014 or HNFE 2014H) and (BCHM 2024 or BCHM 3114 or BCHM 4115)

**Instructional Contact Hours:** (3 Lec, 3 Crd)

**HNFE 4026 - Metabolic Nutrition (3 credits)**

**Prerequisite(s):** HNFE 4025

**Instructional Contact Hours:** (3 Lec, 3 Crd)

**HNFE 4114 - Food and Nutritional Toxicology (3 credits)**

Principles of food and nutritional toxicology with primary emphasis on food components and food toxins including absorption, metabolism and excretion. An overview of types of adverse food reactions including food allergy, food sensitivity, and food intolerance. An overview of U.S. and international laws and regulation of safety assessment of foods including food additives, dietary supplements, and residues of contaminants, pesticides, and antibiotics. Analysis of food and nutritional toxicity cases in the context of the food system, regulatory policies, and public communication.

**Prerequisite(s):** BMSP 2136 and BCHM 2024 and HNFE 2484

**Instructional Contact Hours:** (3 Lec, 3 Crd)

**HNFE 4125 - Medical Nutrition Therapy (3 credits)**

Study of nutritional diagnostic, therapeutic and counseling services provided by a registered dietitian. 4125: Emphasis on the relationship between principles of nutritional care and the medical treatment of individuals with selected diseases or clinical problems. 4126: Integration of knowledge of pathophysiology, biochemical, and clinical parameters, medical treatment and nutrition therapy for patients with selected clinical problems/disease states.

**Prerequisite(s):** HNFE 2004 and HNFE 4026

**Corequisite(s):** HNFE 3034

**Instructional Contact Hours:** (3 Lec, 3 Crd)

**HNFE 4126 - Medical Nutrition Therapy (3 credits)**

Study of nutritional diagnostic, therapeutic and counseling services provided by a registered dietitian. 4125: Emphasis on the relationship between principles of nutritional care and the medical treatment of individuals with selected diseases or clinical problems. 4126: Integration of knowledge of pathophysiology, biochemical, and clinical parameters, medical treatment and nutrition therapy for patients with selected clinical problems/disease states. 4125: I. 4126: II.

**Prerequisite(s):** HNFE 4125

**Instructional Contact Hours:** (3 Lec, 3 Crd)

**HNFE 4134 - Experiential Approach to Nutritional Therapy (2 credits)**

Use of didactic and experiential methods to learn and apply theories of behavior change in diverse nutrition counseling situations. Pre: Instructor approval. I

**Prerequisite(s):** HNFE 4644

**Corequisite(s):** HNFE 4125

**Instructional Contact Hours:** (2 Lec, 2 Crd)

**HNFE 4174 - Nutrition and Physical Performance (3 credits)**

Nutritional requirements for the wellbeing and optimal performance of athletes. Methods of assessment and modification of diet, performance, and body composition in athletes. Evaluation of dietary ergogenic aids and supplements for performance and body composition.

**Prerequisite(s):** HNFE 2804

**Corequisite(s):** HNFE 4025

**Instructional Contact Hours:** (3 Lec, 3 Crd)

**HNFE 4224 - Alternative and Complementary Nutrition Therapies (2 credits)**

Critical evaluation of health claims, mechanisms of action, and research literature for a wide variety of alternative nutrition therapies used for disease prevention and treatment. Practical application of knowledge through completion of problem-based learning projects.

**Prerequisite(s):** (BIOL 1005 or BIOL 1105 or BIOL 1205H) and (BIOL 1006 or BIOL 1106 or BIOL 1206H) and (CHEM 1036 or CHEM 1056) or ISC 2106 and HNFE 2484

**Instructional Contact Hours:** (2 Lec, 2 Crd)

**HNFE 4254 - Experimental Foods (2 credits)**

Experimental study of the functions of ingredients and factors affecting food quality with emphasis on an independent project.

**Prerequisite(s):** HNFE 3234

**Instructional Contact Hours:** (1 Lec, 3 Lab, 2 Crd)

**HNFE 4354 - Dietary Supplements and Health (3 credits)**

Practical and fundamental aspects of widely used dietary supplements (micronutrients, macronutrients, prebiotics, probiotics, plant extracts, bioactive compounds,). Efficacy and mechanism of dietary and botanical supplements in weight management, health promotion, and disease prevention. Interaction of dietary supplements with gut microbiome. Safety and regulatory considerations of dietary supplements. Project-based learning practice with the integration of literature review, project development, writing, and oral presentation.

**Prerequisite(s):** (BCHM 2024 or BCHM 3114) and (BMSP 2136 and HNFE 2484)

**Instructional Contact Hours:** (3 Lec, 3 Crd)

**HNFE 4514 - Nutritional Genomics (3 credits)**

Interactions between foods and nutrients with genetics, genomic DNA, and gene expression in humans and animals. Genetic variants that affect optimal health, metabolism and nutrition in individuals, as well as inheritance of these variants in individuals, and allele frequencies in populations. Scientific, ethical, and legal considerations of genes and nutrition knowledge, personalized testing, and genetic engineering. Junior standing.

**Prerequisite(s):** HNFE 2484

**Instructional Contact Hours:** (3 Lec, 3 Crd)

**HNFE 4624 - Community Nutrition (3 credits)**

The application of nutrition principles to an analysis of current applied nutrition programs and a study of the political and legislative processes affecting the practice of dietetics. I

**Prerequisite(s):** (HNFE 2014 or HNFE 2014H) and HNFE 4026

**Instructional Contact Hours:** (3 Lec, 3 Crd)

**HNFE 4634 - Socio-Cultural Food Systems (3 credits)**

Study of social, cultural, and economic aspects of food systems, using quantitative and qualitative methods to assess nutritional status.

**Prerequisite(s):** HNFE 1004 and SOC 3004

**Instructional Contact Hours:** (2 Lec, 2 Lab, 3 Crd)

**HNFE 4644 - Health Counseling (3 credits)**

Roles, responsibilities, legal requirements and scope of the health professional. Interviewing, counseling, education, health promotion and behavior change strategies for diverse populations. Guidance and referral, health assessment, communication skills, and problem-solving. Application of counseling techniques such as goal-setting, ethical practice, cultural competence, evidence-based practice. Pre: Junior Standing.

**Instructional Contact Hours:** (3 Lec, 3 Crd)

**HNFE 4645 - Applications in Nutrition Counseling (2 credits)**

4645: Experiential methods to apply theories of behavior change to promote nutrition and health changes. Learn and apply nutrition care process using evidence-based knowledge through providing client-centered counseling to individuals. Understanding of contemporary issues related to behavior change and emerging issues through review of lay and professional literature. 4646: Advance nutrition counseling skills through work with more diverse clients. Learn and apply quality improvement skills to enhance nutrition counseling service. Identify information on emerging issues and apply appropriately in counseling setting.

**Prerequisite(s):** HNFE 4644

**Corequisite(s):** HNFE 4125

**Instructional Contact Hours:** (2 Lec, 2 Crd)

**HNFE 4646 - Applications in Nutrition Counseling (2 credits)**

**Prerequisite(s):** HNFE 4645

**Instructional Contact Hours:** (2 Lec, 2 Crd)

**HNFE 4754 - Advanced Human Anatomy and Pathophysiology (3 credits)**

Advanced laboratory course in human anatomy and physiology with an emphasis on how pathologic disease states affect human homeostasis. Congenital, genetic, chronic, and common global diseases with recognition and evaluation of causes, risk factors, and impact on body systems. Cadaver prosections will supplement models, specimens, and an advanced anatomy visualization system. Intended for students pursuing graduate education in health sciences.

**Prerequisite(s):** BMSP 2136 and BMSP 2146

**Instructional Contact Hours:** (2 Lec, 3 Lab, 3 Crd)

**HNFE 4774 - Advanced Contemporary Topics in HNFE (1-3 credits)**

A variable-content course. Explores advanced topics in the areas of nutrition, foods, exercise or health using higher-order thinking and problem-solving skills. Qualitatively and quantitatively assess current facts supported by scientific literature, as well as controversial issues with conflicting data. May be repeated for a maximum of six credits. Junior Standing.

**Prerequisite(s):** HNFE 2014 or HNFE 2014H and HNFE 2484

**Instructional Contact Hours:** (1-3 Lec, 1-3 Crd)

**Repeatability:** up to 6 credit hours

**HNFE 4804 - Exercise Metabolism and Disease (3 credits)**

Explores the role of exercise in the pathophysiology of human metabolic disease with an emphasis on obesity, diabetes, insulin resistance, and exercise tolerance at whole body, cellular and molecular level dysfunction. In-depth assessment of the prospect of exercise as preventive and therapeutic for treatment of metabolic diseases.

**Prerequisite(s):** HNFE 4025 and HNFE 2804

**Corequisite(s):** HNFE 3804

**Instructional Contact Hours:** (3 Lec, 3 Crd)

**HNFE 4814 - Advanced Athletic Injuries (2 credits)**

Medical documentation and administration. Practical experience in locating, identifying, and evaluating anatomic structures Mechanisms of injury and healing process, testing and evaluation of athletic injuries, treatment and rehabilitation of injury to return to play. Not part of an accredited athletic training program.

**Prerequisite(s):** HNFE 2824 and HNFE 3804

**Instructional Contact Hours:** (1 Lec, 3 Lab, 2 Crd)

**HNFE 4824 - Advanced Kinesiology (3 credits)**

Advanced study of human movement during exercise. Integration of biomechanical, anatomical and neuromuscular concepts in the regulation of joint movement associated with exercise, injury and disease.

**Prerequisite(s):** HNFE 3824 and HNFE 2484

**Instructional Contact Hours:** (3 Lec, 3 Crd)

**HNFE 4834 - Applications in Clinical Exercise (3 credits)**

Supervised experience with the Therapeutic Exercise and Community Health Center. Direct Involvement with rehabilitative and preventive exercise and lifestyle programming for cardio-vascular, musculo-skeletal, and other conditions. Exercise leadership, case management, and daily operations. Included seminars, lab experience, and individual meetings with participants and supervisors, related projects.

**Prerequisite(s):** HNFE 3874

**Instructional Contact Hours:** (9 Lab, 3 Crd)

**HNFE 4844 - Exercise and Neuromuscular Performance (3 credits)**

Functional properties of the neuromuscular system. Emphasis placed on the acute and chronic responses of muscle in exercise, rehabilitation and the factors which determine human performance. Special emphasis on the molecular biological factors responsible for skeletal muscle development and differentiation, as well as adaptation to training and disease states, including activation of signal cascades responsible for the changes in muscle performance.

**Prerequisite(s):** HNFE 3804 and HNFE 2484

**Instructional Contact Hours:** (3 Lec, 3 Crd)

**HNFE 4854 - Internship in Exercise Science and Health Promotion (1-3 credits)**

Capstone internship experience in the fields of exercise science and/or health promotion. The student will be immersed in the day-to-day challenges and responsibilities of a practicing health-fitness professional. The 45 contact hours per credit will involve work experience in some aspect of exercise science and/or health promotion. Senior standing and Exercise and Health Promotion majors only. May be repeated for maximum 3 credits.

**Prerequisite(s):** HNFE 4834

**Instructional Contact Hours:** (1-3 Lec, 1-3 Crd)

**Repeatability:** up to 3 credit hours

**HNFE 4954 - Study Abroad (1-19 credits)**

**Instructional Contact Hours:** Variable credit course

**HNFE 4964 - Field Study (1-19 credits)**

**Instructional Contact Hours:** Variable credit course

**HNFE 4974 - Independent Study (1-19 credits)**

**Instructional Contact Hours:** Variable credit course

**HNFE 4974H - Independent Study (1-19 credits)**

**Instructional Contact Hours:** Variable credit course

**HNFE 4984 - Special Study (1-19 credits)**

**Instructional Contact Hours:** Variable credit course

**HNFE 4994 - Undergraduate Research (1-19 credits)**

**Instructional Contact Hours:** Variable credit course

**HNFE 4994H - Undergraduate Research (1-19 credits)**

**Instructional Contact Hours:** Variable credit course