

# EXERCISE AND NUTRITION SCIENCES (EXNS)

## Explanation of Course Numbers

- Courses in the 1000s are primarily introductory undergraduate courses
- Those in the 2000s to 4000s are upper-division undergraduate courses that also may be taken for graduate credit with permission and additional work assigned
- Those in the 6000s and 8000s are for master's, doctoral, and professional-level students
- The 6000s are open to advanced undergraduate students with approval of the instructor and the dean or advising office

### **EXNS 1099. Variable Topics. 36 Credits.**

#### **EXNS 1103. Professional Foundations in Exercise Science. 1 Credit.**

Introduction to the science and practice of exercise and human movement as they relate to public health; sub-disciplines of exercise science, research related to the field, and professional and career development. Credit cannot be earned for this course and EXNS 1109.

#### **EXNS 1109. Professional Foundations in Nutrition. 1 Credit.**

Overview of nutrition and current challenges in the field. Sub-disciplines of nutrition and the ways in which they work together to answer important research questions concerning human health. Credit cannot be earned for this course and EXNS 1103.

#### **EXNS 1110. Applied Anatomy and Physiology I. 4 Credits.**

Fundamentals of human anatomy and physiology for students preparing for health sciences professions. Emphasis on bones, joints, muscles, innervation, and blood supply. Laboratory fee.

#### **EXNS 1111. Applied Anatomy and Physiology II. 4 Credits.**

Continuation of EXNS 1110. Fundamentals of human anatomy and physiology for students preparing for health sciences professions. Emphasis on muscles, sensory and motor integration of the nervous system, function of the special senses, and the autonomic system. Laboratory fee. Prerequisites: EXNS 1110.

#### **EXNS 1112. Current Issues in Coaching. 3 Credits.**

Examination of current trends and issues in athletics, sport, and coaching from theoretical and applied perspectives. Study of a variety of timely topics using presentations, readings, videos, internet activities, and discussions.

#### **EXNS 1113. Medical Terminology. 3 Credits.**

Basic study of communication using medical and scientific language/terminology. Focus on the foundations of scientific and medical vocabulary including prefixes, suffixes, and stems used to form words.

#### **EXNS 1114. Community Nutrition. 3 Credits.**

Introduction to community nutrition and public health programs offered on the local, state, national, and international levels, targeting both individuals and groups. Topics include health policies, nutrition programs, nutrition assessment, and principles of nutrition education.

#### **EXNS 1117. Principles of Coaching. 3 Credits.**

Study of coach/athlete behavioral patterns and interactions, coaching methods, and interdisciplinary principles applicable to coaching.

#### **EXNS 1118. Sport and Nutrition. 3 Credits.**

Nutritional needs for recreational exercise and sports; skills in assessing nutritional needs; development of individual nutrition programs that are sport/activity-specific; and identification and correction of nutrition problems affecting sports performance. Prerequisites: EXNS 2119 or HLWL 1116.

#### **EXNS 1119W. Children and Sport. 3 Credits.**

Psychomotor, psychosocial, and physiological factors of children's participation in sports. The importance of sport to children, readiness to compete, adaptations to training, participation motives, social factors, fundamentals of training, nutrition, stress, and child protection. Theoretical aspects applied in a variety of sports settings. Includes a significant engagement in writing as a form of critical inquiry and scholarly expression to satisfy the WID requirement.

#### **EXNS 1199. Topics in Exercise and Nutrition Sciences. 3 Credits.**

Topics vary by semester. May be repeated for credit provided the topic differs. Consult the Schedule of Classes for more information.

#### **EXNS 2110. Injury Prevention and Control. 3 Credits.**

Information and practical experience in the prevention, recognition, and/or treatment of injury, illness, and health conditions; anatomy review, injury recognition skills, and prevention, first aid, and treatment techniques. Prerequisites: EXNS 1110 and EXNS 1111.

#### **EXNS 2111. Exercise Physiology I. 4 Credits.**

Function of the human body under the influence of physical activity. Nutrition as a foundation for human performance, energy for physical activity, and comprehensive weight management. Laboratory fee. Prerequisites: EXNS 1110 and EXNS 1111.

#### **EXNS 2112. Exercise Physiology II. 4 Credits.**

Response of physiological systems of the body to acute and chronic exercise and neuromuscular adaptations to exercise. Exercise training program design, training in extreme environmental conditions, and training considerations for special populations. Laboratory fee. Prerequisites: EXNS 2111.

**EXNS 2113. Kinesiology. 4 Credits.**

How the human body functions as a mechanical movement generator; the design and function of joints and muscles and principles of mechanics applied to human movement. Common injuries to the musculoskeletal system, how these injuries might occur, and what effect they have on movement patterns. Laboratory methods including techniques for palpation and evaluation of movement. Laboratory Fees. Prerequisites: ANAT 2181 or BISC 2581 or EXNS 1110.

**EXNS 2116. Exercise and Health Psychology. 3 Credits.**

The psychological, social, and environmental factors that influence the adoption and maintenance of physical activity/exercise and other health behaviors. The role of physical activity/exercise in the prevention of chronic disease. Emphasis on prominent theories used to understand and predict behavior change towards the initiation and maintenance of health behaviors. Issues specific to public health and diversity such as race/ethnicity, socioeconomic status, and gender are also addressed. Restricted to majors only. Prerequisites: PSYC 1001.

**EXNS 2117. Sport Psychology. 3 Credits.**

Introduction to current research and theoretical perspectives on psychological and psychosocial components of sport participation and competition. Participation motives, motivation, confidence, anxiety, aggression, and other factors that influence individuals and teams or groups. Prerequisites: PSYC 1001.

**EXNS 2117W. Sport Psychology. 3 Credits.**

Introduction to current research and theoretical perspectives on psychological and psychosocial components of sport participation and competition. Participation motives, motivation, confidence, anxiety, aggression, and other factors that influence individuals and teams or groups. Students complete written assignments to hone writing skills and apply course material. Includes a significant engagement in writing as a form of critical inquiry and scholarly expression to satisfy the WID requirement. Prerequisite: PSYC 1001.

**EXNS 2119. Introduction to Nutrition Science. 3 Credits.**

Nutrition science as it relates to human growth and development; dietary guidelines, digestion and absorption of nutrients, appetite, body weight, and chronic disease; how the body uses vitamins, minerals, and energy provided by fats, carbohydrates, and proteins; assessing nutritional status; nutrition on an individual and population level. Prerequisites: BISC 1111; or BISC 1115 and BISC 1125.

**EXNS 2120. Assessment of Nutritional Status. 3 Credits.**

Methods of assessing dietary intakes, physical activity, anthropometry, body composition, and micronutrient status of individuals; factors affecting selection, reliability, and interpretation of various assessment methods in public health settings. Prerequisites: EXNS 2114 and EXNS 2115; or EXNS 2119.

**EXNS 2121. Orthopedic Taping and Bracing. 1 Credit.**

Advanced practical application of skills learned in EXNS 2110, including first aid techniques, injury recognition skills, taping, and treatment of injuries. Concurrent enrollment in EXNS 2110 is required for students in the pre-athletic training/sports medicine track.

**EXNS 2122. Food Systems in Public Health. 3 Credits.**

Systems thinking pertaining to agriculture and food. Defining sustainability in the context of the global food system; the current state of the global food system from farm to fork; effects on health. Creating a healthier, more sustainable system.

**EXNS 2123. Nutrition and Chronic Disease. 3 Credits.**

Address the relationships between nutrition and chronic disease; obesity, diabetes, hypertension, cardiovascular disease, cancer, inflammatory conditions, musculoskeletal disorders, and neurodegenerative diseases. Prerequisites: EXNS 2114 and EXNS 2115; or EXNS 2119.

**EXNS 2124. Lifecycle Nutrition. 3 Credits.**

Overview of the science of nutrition as it relates to health throughout the major phases of the human life cycle. Prerequisites: EXNS 2114 and EXNS 2115; or EXNS 2119. Credit cannot be earned for this course and EXNS 6242.

**EXNS 2126W. International Nutrition. 3 Credits.**

International policies, programs, and contextual factors related to malnutrition and the effects of nutrition throughout the lifecycle. Focus on low- and middle-income countries, which experience the greatest burden of malnutrition. Includes a significant engagement in writing as a form of critical inquiry and scholarly expression to satisfy the WID requirement.

**EXNS 2127. Introduction to Food Policy. 3 Credits.**

Introduction to food and nutrition policy, with a focus on the process for developing and implementing policy, the stakeholders involved, and the complex issues that facilitate and challenge policy development.

**EXNS 2128. Scientific Principles of Strength and Conditioning. 3 Credits.**

The role that strength and conditioning training plays in athletic performance and health. Emphasis on human structural, anatomical, neuromuscular, and metabolic adaptations in response to physical performance training. Prerequisites: EXNS 2111.

**EXNS 3101. Independent Study. 3 Credits.**

Outline of intended project must be approved prior to course registration. Restricted to students in the BS programs in exercise science and nutrition science.

**EXNS 3102. Applied Sport Psychology. 3 Credits.**

Theoretical perspectives and practical aspects of applied sport psychology. Psychological skills and peak mental performance. Development and practical application of mental skills programs for athletes and methods of assessing psychological skills in sports settings. Qualifications and training routes for becoming a sport psychologist and professional and ethical issues. Prerequisites: EXNS 2117.

**EXNS 3103. Training and Conditioning Program Design and Application I. 4 Credits.**

Function and response of the human body under the influence of various performance training methods, including exercise preparation, recovery, torso strength and stability, joint mobility, muscular flexibility, and aerobic capacity. Prerequisites: EXNS 2111, EXNS 2112, and EXNS 2128.

**EXNS 3104. Training and Conditioning Program Design and Application II. 4 Credits.**

Continuation of EXNS 3103. Function and response of the human body under the influence of various performance training methodologies and periodization strategies, including muscular strength, power, speed, agility, and anaerobic capacity. Prerequisites: EXNS 3103.

**EXNS 3110. Field Experience - Exercise and Nutrition Sciences. 1-9 Credits.**

Application of classroom-based knowledge to practical experience within a professional setting. Permission of the instructor is required prior to enrollment. Restricted to students in the BS programs in exercise science and nutrition science. Prerequisites: EXNS 2112.

**EXNS 3111W. Exercise and Nutrition Sciences Research Methods. 3 Credits.**

Approaches and techniques used in exercise and nutrition science research, with a focus on human studies; development and critique of study designs, commonly encountered measurement and analysis issues, and human research ethics. Prerequisites: EXNS 2114 and EXNS 2115; or EXNS 2119. Includes a significant engagement in writing as a form of critical inquiry and scholarly expression to satisfy the WID requirement.

**EXNS 3117. Injury Assessment. 4 Credits.**

Students gain skills and practical experience in the assessment of injuries. Includes anatomy review, evaluation techniques and procedures, referral skills, and appropriate documentation. Prerequisites: EXNS 2110.

**EXNS 3118. Therapeutic Modalities in Sports Medicine. 4 Credits.**

Explanation and demonstration of the use of therapeutic modalities on the healing process, including discussion of the use of therapeutic modalities to enhance the rehabilitation process after athletic injury. Laboratory fee. Prerequisites: EXNS 3117 or permission of instructor.

**EXNS 3119. Therapeutic Exercise in Sports Medicine. 4 Credits.**

Explanation and demonstration of the use of therapeutic exercise on the rehabilitation process. Discussion and development of practical skills in techniques of therapeutic exercise and equipment to enhance the exercise routine after athletic injury. Prerequisites: EXNS 3117 or permission of instructor.

**EXNS 3121. Medical Issues in Sports Medicine. 3 Credits.**

Topics in general medical issues and pharmacology as they relate to the athletic training profession. Prerequisites: EXNS 1110 and EXNS 1111.

**EXNS 3123W. Psychology of Injury and Rehabilitation. 3 Credits.**

Psychological, social, and environmental factors that influence injury susceptibility, reaction to injury, and adherence to rehabilitation; basic assessment and intervention techniques to promote and facilitate adherence to rehabilitation. Restricted to students in the BS and minor programs in exercise and nutrition sciences. Prerequisites: PSYC 1001. Includes a significant engagement in writing as a form of critical inquiry and scholarly expression to satisfy the WID requirement.

**EXNS 3125. Athletic Training Practicum. 3 Credits.**

Students gain practical/clinical experience in athletic training and medical skills.

**EXNS 3199. Advanced Topics in Exercise and Nutrition Sciences. 3 Credits.**

Topics vary by semester. Consult the Schedule of Classes for more information.

**EXNS 3995. Undergraduate Research. 1-3 Credits.**

Students work under the mentorship of a faculty member to acquire knowledge and skills central to the design, conduct, and/or analysis of scientific research. Project proposal must be approved by the instructor and dean's office prior to enrollment. Credit cannot be earned for this course and PUBH 3995.

**EXNS 4110. Current Issues in Exercise Science. 3 Credits.**

Capstone course for senior exercise science majors in their final spring semester. Students are required to understand and apply identified competencies from the core exercise science curriculum. Restricted to seniors in the BS in exercise science program in their final spring semester.

**EXNS 4112. Nutrition Senior Capstone Seminar. 1 Credit.**

Students demonstrate their understanding of and apply identified competencies from the core nutrition curriculum. Restricted to seniors in the BS in nutrition program in their final spring semester.

**EXNS 4199. Advanced Topics in Exercise and Nutrition Sciences. 3 Credits.**

Topics vary by semester. Consult the Schedule of Classes for more details.

**EXNS 6202. Advanced Exercise Physiology I. 3 Credits.**

Examination of acute and chronic cardiovascular and pulmonary adaptations to exercise training. Focus on mechanisms that affect oxygen delivery and utilization during aerobic exercise. Responses to exercise in extreme environmental conditions.

**EXNS 6203. Advanced Exercise Physiology II. 3 Credits.**

Metabolic and neuromuscular adaptations that occur in response to acute and chronic exercise. Biochemical pathways responsible for energy production during rest and exercise, and how these pathways adapt with chronic training. Neural, hormonal, and nutritional factors that influence exercise performance. Laboratory fees. Prerequisites: EXNS 6202 or permission of instructor.

**EXNS 6204. Biostatistical Methods and Research Design. 3 Credits.**

Basic principles, concepts, and procedures of research, sampling, and statistical design. Probability, hypothesis testing, and application of basic statistical techniques using calculators and statistical software packages.

**EXNS 6207. Psychological Aspects of Sport and Exercise. 3 Credits.**

Psychological, sociological, and environmental factors related to the adoption of exercise behavior and maintenance and achieving peak sport performance. The influence of psychology on exercise and sport behaviors, and techniques for changing and/or optimizing such behaviors using a person-centered, individual approach. Issues specific to public health and diversity including race, socioeconomic status, ethnicity, and gender are emphasized throughout the course.

**EXNS 6208. Physical Activity: Physiology and Epidemiology. 2 Credits.**

Introduction to health issues resulting from physical inactivity (or disuse). Basic principles of energy metabolism and both basic and leading edge methods for physical activity assessment. Topics include major physiological systems' adaptation to exercise training and to de-training and how this adaptation may vary by age and sex; the relationship between disuse and major chronic diseases across the age spectrum; and individual and community-based intervention strategies to modify behavior and ameliorate the putative effects of a sedentary lifestyle. Study of the role of the built environment as an environmental "toxin" using the basic principles of environmental health risk assessment. Prerequisites: EXNS 2111.

**EXNS 6209. Advanced Concepts in Nutrition Science. 3 Credits.**

Topics in nutrition and public health.

**EXNS 6220. Power Training for Sports Performance. 2 Credits.**

Effective training programs for sports that require explosive performance. Emphasis on training methods that develop speed and power, such as plyometrics and Olympic weightlifting. Provides information on specific competencies for students interested in pursuing certification as a strength and conditioning specialist. Prerequisites: EXNS 2111 or equivalent.

**EXNS 6221. Science and Theory of Training. 3 Credits.**

Physiological adaptations to resistance training, with a primary focus given to the neuromuscular system. Functional and structural changes that occur in skeletal muscle following strength and power training. Programmatic concerns when developing a resistance training regimen for an athletic population.

**EXNS 6222. Current Topics in Strength and Conditioning. 1-2 Credits.**

Current scientific findings related to the field of strength and conditioning. Examination of how resistance training programs affect athletic performance in terms of increased strength, power, endurance, and resistance to injury. The health benefits of resistance training in non-athletic populations. Prerequisites: EXNS 6202 or permission of the instructor.

**EXNS 6223. Biomechanical Analysis. 3 Credits.**

Application of mechanical analysis techniques to the human body in motion. Statics and dynamics with emphasis on the link segment model, incorporating angular velocity and angular acceleration. Motion analysis systems and computer systems. Prerequisites: (EXNS 1110 or BISC 2581) and EXNS 2113. Recommended background: PHYS 1011.

**EXNS 6232. Independent Study. 1-3 Credits.**

Students gain or enhance public health knowledge and explore an area of interest related to public health research or the delivery and/or administration of health services. Permission of instructor or advisor required. Restricted to students in the MS in exercise science program.

**EXNS 6233. Graduate Internship. 1-6 Credits.**

Fieldwork, internship, and/or instructional practice related to the field of study as pre-approved by the advisor. May be repeated for credit up to a maximum of 6 credits with prior permission of the advisor. Restricted to students in the MS in exercise science program.

**EXNS 6242. Nutrition Throughout the Life Cycle. 2 Credits.**

The science of nutrition as it relates to health throughout the human life cycle. Changes in human metabolic processes and nutrient needs during the course of the aging process. Nutrition-related disorders. Restricted to students in the MPH program. Prerequisites: PUBH 6619 or permission of the instructor.

**EXNS 6261. Thesis Seminar. 3 Credits.**

Required for students planning to write a thesis. Principles, concepts, and procedures of research design, including interpreting the scientific literature, designing a statistical plan, applying basic statistical techniques, and communicating scientific findings to professional and general audiences. Students develop a research protocol.

**EXNS 6299. Topics in Exercise Science. 1-3 Credits.**

Topic to be announced in the Schedule of Classes.

**EXNS 6810. Advanced Metabolism. 3 Credits.**

Regulation of metabolic pathways and energy metabolism; carbohydrate metabolism, lipid metabolism, and protein metabolism. Regulation of metabolic pathways to match energy demand and the role of metabolic dysregulation in metabolic disorders. Prerequisites: EXNS 6202 or PUBH 6619.

**EXNS 6998. Thesis Research. 3 Credits.**

Students work independently to conduct research under the oversight of a faculty research committee. Restricted to students in the MS in exercise science program.

**EXNS 8102. Writing a Research Grant Application. 1 Credit.**

Prepares students to complete a competitive research grant application. Introduction to different sources of funding and funding mechanisms as well as the different eligibility requirements for these funding mechanisms. Restricted to PhD students in GW SPH. Prerequisites: EXNS 6204 and PUBH 6003.

**EXNS 8106. Advanced Concepts in Applied Human Physiology. 3 Credits.**

Details of the major physiological systems: cardiovascular, respiratory, muscular, and neural systems. Integration and regulation of physiological systems to physiological demands and pathological changes in metabolic disorders.

**EXNS 8108. Laboratory Techniques in Human Physiology and Nutrition. 3 Credits.**

Introduction of lab techniques in human measurement and the scientific theory underlying their application. Focus on assessment of diet, body composition, calorimetry, cardiovascular homeostasis, muscular strength and endurance in human assessment. Prerequisites: EXNS 6202 or PUBH 6619 or with permission of the instructor.

**EXNS 8110. Seminar in Exercise Physiology and Applied Nutrition. 1-2 Credits.**

Provides insight into the breadth of research in nutrition and exercise sciences and training in the critical interpretation of research articles, scientific writing, and oral presentations. Topics vary by semester. Restricted to students in the PhD in exercise physiology and applied nutrition program. Prerequisites: EXNS 6202 and PUBH 6619 or equivalent.

**EXNS 8199. Doctoral Topics. 3 Credits.**

Topics vary by semester. May be repeated for credit provided the topic differs. Consult the Schedule of Classes for more details.

**EXNS 8999. Dissertation Research. 1-12 Credits.**

Dissertation research.