

# EXERCISE SCIENCE AND PRE-HEALTH PROFESSIONS

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Exercise Science is the study of the human body's metabolic and physiological response and adaptation to acute and chronic exercise. The coursework encompasses several disciplines including human anatomy, human physiology, exercise physiology, biochemistry, biomechanics, and nutrition that provide a framework for the development of exercise and nutrition-based intervention programs for disease prevention, enhanced human performance, and therapeutic rehabilitation. The Exercise Science & Pre-Health Professions major prepares students for admission into several health-related professional programs including physical therapy, occupational therapy, medicine, physician assistant, dentistry, accelerated nursing, and cardiopulmonary rehabilitation. The curriculum also prepares students to become nationally certified by the American College of Sports Medicine and the National Strength and Conditioning Association for employment as Certified Exercise Physiologists, Certified Personal Trainers, and Certified Strength and Conditioning Specialists.

## Specific Requirements for Admission to Exercise Science and Pre-Health Professions

Enrollment is based upon the following requirements: A minimum of 30 credits in Creighton University coursework with a cumulative GPA of 2.75 or higher; a grade of "C" or better in one semester of CHM 203 General Chemistry I/CHM 204 General Chemistry I Laboratory or CHM 205 General Chemistry II/CHM 206 General Chemistry II Laboratory and one semester of BIO 202 General Biology: Cellular and Molecular/BIO 206 General Biology: Cellular and Molecular Laboratory or BIO 201 General Biology: Organismal and Population/BIO 205 General Biology: Organismal and Population Laboratory. Students apply for admission to the major through the College of Arts and Sciences website.

## B.S., Exercise Science and Pre-Health Professions requirements (41-42 credits)

Code	Title	Credits
EXS 125	First Aid	2
EXS 142	Weight Training and Program Design	1
EXS 144	Aerobic Conditioning and Group Fitness	2
EXS 240	Foundations of Fitness and Wellness	3
EXS 320	Human Physiology	4
EXS 331	Human Anatomy	4
EXS 335	Exercise Physiology	4
EXS 350	Nutrition for Health and Sports Performance	3
EXS 391	Career Preparation and Professionalism	3
EXS 401	Exercise Prescription	3
EXS 407	Basic Statistics and Research Design	3
EXS 489	Laboratory Methods and Procedures	4
EXS 492	Exercise Science Internship	2
Choose one of the following courses:		3-4
EXS 334	Biomechanics	
EXS 534	Neuromechanics of Human Movement	

Total Credits

41-42

## Courses

### EXS 111. Fundamentals of Human Anatomy. 4 credits. FA, SP, SU

A general survey course to provide nursing and other pre-professional students with a basic knowledge of human anatomy. Lecture topics range from anatomical terminology to comprehensive overviews of the individual organ systems, including aspects of gross anatomy, histology, and neuroanatomy. 4R. P. Nursing major or Instructor Consent.

### EXS 112. Fundamentals of Human Physiology. 4 credits. FA, SP, SU

A general survey course to provide nursing and other pre-professional students with a basic knowledge of the function of the human body. Essential principles of human physiology are presented including basic chemistry, cell and tissue studies, and a general overview of the body systems. P. Nursing major or Instructor consent.

### EXS 125. First Aid. 2 credits. FA, OD, SP

American Red Cross First Aid and CPR/AED Professional Rescuers and Healthcare Certifications may be earned. Emphasis on recognizing an emergency and providing care until professional medical help arrives. Students should expect to pay an additional fee for first aid supplies and Red Cross Certification fee.

### EXS 142. Weight Training and Program Design. 1 credit. FA, SP

Applied principles, techniques and participation in weight training activity for healthy populations. Lecture topics include explanations of the major muscle groups, safety issues, proper lift technique, and introduction to basic program design for improving muscular strength, hypertrophy, muscular endurance, and flexibility.

### EXS 144. Aerobic Conditioning and Group Fitness. 2 credits. FA, SP

An introduction to fitness concepts and basic program design to promote cardiovascular fitness, flexibility, and muscular endurance for life through a variety of group exercise programs. Includes participation and instruction in high and low impact aerobic training, kickboxing, circuit and interval training, and other popular methods of group fitness training. Students lead a fitness class as part of course requirements.

### EXS 150. Beginning Pickleball. 1 credit. FA, SP

This course introduces students to instructional techniques, analysis, demonstration, and practice in the basic skills of pickleball. Students will also learn the rules of the game, scoring, selection and care of equipment, and basis court strategy.

### EXS 151. Beginning Tennis. 1 credit. FA, SP

Instructional techniques, analysis, demonstration, and practice in the basic skills of tennis. Includes rules, selection and care of equipment, strategy on the court.

### EXS 152. Intermediate Tennis. 1 credit. OD

Instructional techniques, analysis, demonstration, and practice in the intermediate skills of tennis. Some advanced strategies and skills. P. EXS 151 or IC.

### EXS 161. Life Skills for Student Athletes. 1 credit. FA, SP

This course is designed to educate NCAA Division I student-athletes in the dynamics of intercollegiate athletics through participation in all aspects of their respective sport, including conditioning, team drills and activities, academic enrichment, community service, and life skills training. Graded Satisfactory/Unsatisfactory. Can be taken for up to a maximum of 4 credits.

**EXS 190. Introduction to Jiu-Jitsu. 2 credits. FA, OD, SP**

Students will be instructed in Jiu-Jitsu techniques that can be utilized for both sport and self-defense. The course incorporates both offensive and defensive movements with a focus on control and position. This is an introductory course with emphasis placed upon skill development and not direct physical contact itself. The class is appropriate for individuals with no prior Jiu-Jitsu or martial arts experience.

**EXS 195. Introduction To Athletic Training. 3 credits. FA, SP**

Cognitive and practical experiences designed to introduce basic athletic training principles and skills to students entering the field of sports medicine and other health care careers.

**EXS 240. Foundations of Fitness and Wellness. 3 credits. FA, SP**

This course provides an overview of exercise physiology, nutrition, biomechanics, sociocultural aspects of sport and exercise and other related topics, including career opportunities related to Exercise Science. Students are also introduced to fitness and wellness related concepts, activities, and skills necessary to evaluate personal fitness and develop a lifelong fitness program. Includes two lectures and two laboratories per week.

**EXS 305. Therapeutic Modalities. 3 credits. OD**

Introduces physiological principles, concepts, and operational procedures of therapeutic modalities such as cryotherapy, hydrotherapy, and mechanical therapy as they relate to the care and treatment of injuries. P. EXS 320, EXS 331 or Instructor consent.

**EXS 306. Therapeutic Exercise. 3 credits. OD**

The purpose of this course is to introduce students to the basic principles of rehabilitation and specific therapeutic exercise techniques as they relate to the care of the physically active. Special emphasis will be placed upon the practical use of these principles and techniques in laboratory settings and in the collegiate athletic training room setting in conjunction with practical experience. P. EXS 195, EXS 331 or IC.

**EXS 310. Practicum in Exercise Science. 1 credit. FA, SP**

Provides students with opportunities to enhance professional growth as laboratory teaching assistants or through practical work experience in areas such as athletic training, fitness testing, personal training, strength and conditioning, and wellness programming with professionals affiliated with Creighton University. May be repeated three times. P. EXS major, Jr. stdg. and IC.

**EXS 320. Human Physiology. 4 credits. FA, SP, SU**

An undergraduate human physiology course providing detailed coverage on the normal function of the human organ systems, while also incorporating discussion on physiological changes during physical activity and certain diseases. Information is presented from the cellular level to the entire organism. Lecture, Lab course. P. Understanding Natural Science; BIO 202/BIO 206 or BIO 201/BIO 205; CHM 203/CHM 204 or CHM 205/CHM 206; EXS major or instructor approval.

**EXS 331. Human Anatomy. 0-4 credits. FA, SP, SU**

Provides students with a basic knowledge of the structure and function of the human body. Lecture topics range from anatomical terminology to comprehensive overviews of the individual systems. Dissected cadaver specimens and anatomical models are used as learning aids. Lecture/Lab course. P. BIO 202/BIO 206 or BIO 201/BIO 205; CHM 203/CHM 204 or CHM 205/CHM 206.

**EXS 334. Biomechanics. 4 credits. FA, SP**

Introduction to the biomechanics of human movement. Study of the musculo-skeletal system with special emphasis on the application of physical laws and principles that govern movement of the body. Lecture/Lab course. P. EXS 331, EXS major, or IC.

**EXS 335. Exercise Physiology. 0-4 credits. FA, SP**

Study of the major physiological systems in the body and their response to acute and chronic exercise. Students will be introduced to laboratory techniques to assess body composition anaerobic power and cardiovascular fitness. P. BIO 202/BIO 206 or BIO 201/BIO 205; CHM 203/CHM 204 or CHM 205/CHM 206, EXS 240 and EXS 320 or IC; EXS major.

**EXS 350. Nutrition for Health and Sports Performance. 3 credits. FA, SP, SU**

Considerable information is provided regarding the six classes of nutrients. Lectures focus on applying knowledge in nutrition into a framework upon which performance and conditioning strategies can be based or from which recommendations can be made for health enhancement. P. Contemporary Composition; Oral Communication; EXS 320, EXS 335, EXS major or IC.

**EXS 391. Career Preparation and Professionalism. 3 credits. FA, SP (Magis Designated Oral Communication)**

In this course students develop techniques and strategies for identifying professional fields of interest, assessing marketable skills, building a personal brand, setting goals, and developing a network of contacts, writing resumes, cover letter, and other means of communication used in the search process for employment or admission into advanced programs of study. Students deliver oral presentations and participate in professional interviews with the goal of achieving their career objectives. Magis designated Oral Communication course. P. Oral Communications; EXS major; Junior or Senior standing.

**EXS 395. Lower Body Evaluation. 3 credits. OD**

The study of the evaluation, assessment, and recognition of injuries involving the lower body. Uses knowledge of regional anatomy to assist with learning specific evaluation techniques. P. EXS 195, EXS 331 or IC.

**EXS 396. Upper Body Evaluation. 3 credits. OD**

The study of the evaluation, assessment and recognition of injuries involving the upper body. Uses knowledge of regional anatomy to assist with learning specific evaluation techniques. P. EXS 195, EXS 331 or IC.

**EXS 401. Exercise Prescription. 3 credits. FA, SP**

Case studies, preliminary health screening, risk stratification, fitness evaluations, and the design of exercise prescriptions for both general and special populations. Lecture topics include acute and chronic physiological responses to exercise, cardiorespiratory responses, resistance training, weight management, coronary heart disease and an introduction to metabolic equations and caloric expenditure. P. EXS 142, EXS 144, EXS 331, EXS 335; EXS Major or IC.

**EXS 407. Basic Statistics and Research Design. 3 credits. FA, SP (Magis: Do Soc Sci; Ethics, Oral Com, Stat Reasoning)**

Designed to develop skills to read and interpret research reports effectively. Principles of experimental research design utilized in exercise science will be discussed. General statistical concepts will be introduced, including central tendency, variance, correlation, regression, and means comparison. Students will develop a research proposal and presentation based on a topic in exercise science or related field. Satisfies Magis Core Doing Social Science, Designated Ethics, Oral Communication, and Statistical Reasoning course. P. Understanding Social Science; Ethics; Mathematical Reasoning; Oral Communication; EXS majors; or IC.

**EXS 420. Essentials of Strength and Conditioning. 3 credits. SP**

Theory and practice of designing and administering strength training and conditioning programs for athletes and non-athletes, including special populations. Course content from exercise physiology, anatomy, biomechanics, nutrition and exercise prescription is used in the formulation of programs; instruction of strength training exercises is provided. P. EXS 142, EXS 331, EXS 335, EXS major or IC.

**EXS 489. Laboratory Methods and Procedures. 0-4 credits. FA, SP**

Course designed to develop practical skills and knowledge in laboratory technique, procedures, protocols and exercise prescription in the areas of cardiorespiratory fitness, body composition, muscular fitness, flexibility and basic EKG interpretation. Additional laboratory testing will be required outside of regular class time. Lecture/Lab course. P or CO: EXS 401, EXS major or IC, and current CPR/AED certification.

**EXS 492. Exercise Science Internship. 1-4 credits. FA, SP, SU**

All EXS majors must complete 2 credit hours of internship to meet graduation requirements. The internship is an apprenticeship experience that provides students an opportunity to apply their knowledge and skills obtained in the classroom to a professional environment and receive on-site training in a career of their choice. One credit of internship corresponds to 50 hours of internship site experience. The department internship coordinator assists in identifying and securing an appropriate internship site and with all necessary paperwork and documentation. May be repeated to a limit of 4 credits. P. EXS 391 and IC.

**EXS 493. Directed Independent Readings. 1-4 credits. OD**

This course provides an opportunity to participate in independent readings or literature review in Exercise Science as directed by a faculty mentor. May be repeated to a limit of four credits. P. Jr. stdg.; EXS Major; IC.

**EXS 495. Directed Independent Study. 1-4 credits. OD**

In depth study of special topics pursued independently or in small groups under the direction of a faculty mentor. May be repeated to a limit of four credits. P. Jr. stdg.; EXS major; IC.

**EXS 497. Directed Independent Research. 0-4 credits. FA, OD, SP**

Designed to provide students with the knowledge and skills necessary for conducting research in Exercise Science including review of literature, study design, subject recruitment, data collection, statistical analysis, and manuscript and/or poster presentation. Students may be required to complete university training in research ethics and education, and HIPAA requirements. May be repeated to a limit of 4 credits. P. Jr. stdg.; EXS Major; or IC.

**EXS 534. Neuromechanics of Human Movement. 3 credits. FA, SP**

This course integrates neurophysiology, physics, and biomechanics to explore how the nervous systems controls the actions of skeletal muscles to produce human movement. P. PHY 201, PHY 205, EXS 331; or IC.

**EXS 535. Applied Immunology. 3 credits. OD**

An integrative approach toward understanding how immune function is altered in response to exercise and other stressors. The course will examine the fundamental principles of immunology from an applied, or human perspective. The current literature will serve as source material for study and discussion. P. BIO 202/206 and either EXS 320 or BIO 449 or IC.