Exercise Physiology

Interim Chair: Dr. Kay Malek
Program Coordinator: Dr. Stephen LoRusso

The American College of Sports Medicine and exercise physiologists define an Exercise Physiologist as one who studies the acute and chronic physiological responses and adaptations resulting from physical activity. An exercise physiologist can apply this knowledge to improve or maintain health, fitness, or performance. Traditionally exercise physiologists worked and studied only with athletes to improve performance. Today, however, exercise physiologists also work and study in commercial, clinical, and workplace settings to increase health, fitness, and quality of life in the general population. For example, an exercise physiologist may work as a cardiopulmonary rehabilitation specialist, a personal trainer, or direct an employee fitness program. (www.acsm.org)

The Exercise Physiology program's proposed curriculum, faculty, and resources are consistent with the standards and guidelines of the American College of Sports Medicine.

The Saint Francis University Exercise Physiology Program has two tracks. Track I: Wellness Health Promotion and Pre-Allied Health Concentration is designed to prepare students for immediate employment in the burgeoning wellness, health promotion, and fitness industries or graduate education in physician assistant science, physical therapy, and occupational therapy. Track II: Graduate and Pre-Professional Concentration is designed to prepare students for a career in research or graduate education in exercise physiology or medicine. Additional course work may be required as prerequisites when applying for professional education at Saint Francis University and other institutions. Non-majors may minor in exercise physiology with the approval of the Program Coordinator.

BACHELOR OF SCIENCE IN EXERCISE PHYSIOLOGY
MAJOR REQUIREMENTS
Track I: Wellness Health Promotion and Pre-Allied Health Concentration
Exercise Physiology 101, 102, 103, 205, 210, 250, 305, 310, 312, 320, 330, 360, 390, 400, 405, 398/399, and 4 to 6 credits from the following courses: Exercise Physiology 202, 410, 414, 415; Biology 111, 205, 206; Chemistry 101/102 or 103/104; Physics 104; Mathematics 112; Statistics 101; Psychology 101 and three additional credits in Psychology.

MAJOR REQUIREMENTS
Track II: Graduate and Pre-Professional Concentration
Exercise Physiology 101, 102, 103, 205, 210, 250, 305, 310, 312, 320, 330, 360, 390, 400, 405, 498, and 4 to 6 credits from the following courses: Exercise Physiology 202, 410, 414, 415; Biology 111, 205, 206; Chemistry 101, 102, 203, 204; Physics 104; Mathematics 112; Statistics 101; Psychology 101, 201.

MINOR REQUIREMENTS – Exercise Physiology 101, 102, 103, 300 and 3 courses from the following: Exercise Physiology 202, 205, 210, 250, 310, 312, 320, 330, 360, 405, 410.

EXERCISE PHYSIOLOGY COURSE DESCRIPTIONS

EXPH 101. Introduction to Exercise Physiology
(1 credit)
The history of exercise physiology and an examination of the relationship between physical activity, health, diet, and obesity, and the role the exercise physiologist plays in addressing these issues. There will also be an introduction to the professional organizations, such as the American College of Sports Medicine and the National Strength and Conditioning Association, and the certifications offered by these organizations. *Fall.*

EXPH 102. Introduction to Strength Training
(1 credit)
This course is designed to give the student a broad background in strength training. Various strength training programs, techniques, and trends will be examined. Students will have the opportunity to become familiar with various strength training methods. Open to Exercise Physiology majors and minors only. *Pre-requisites: EXPH 101. Fall.*

EXPH 103. Introduction to Physical Conditioning
(1 credit)
This course teaches how to develop programs of exercise and activity in accordance with individual assessment of status, needs, and goals. It emphasizes individual realistic goal-setting to enable the individual to develop appropriate activity levels throughout the lifespan. Open to Exercise Physiology majors and minors only. *Pre-requisites: EXPH 101. Fall.*

EXPH 202. Introduction to Epidemiology
(3 credits)
Introduction to the study of disease occurrence and the risk factors of disease or any health-related event in a population. *Pre-requisites: STAT 101; PSYC 201. Fall.*

EXPH 205. Common Sports Injuries
(3 credits)
Common injuries resulting from exercise and their treatment and prevention. Topics include mechanics of injury, prevention strategies, and recognition as well as emergency procedures, first aid, basic life support, and related legal issues. *Prerequisites: BIOL 205, 206. Fall.*

EXPH 210. Psychology of Exercise
(3 credits)
Theories of behavior change most related to the promotion and maintenance of increased participation in physical activity for the purposes of living a healthier lifestyle and preventing disease. *Prerequisite: PSYC 101. Spring.*

EXPH 250. Functional Anatomy
(2 credits)
Examination of the neuromuscular and skeletal systems as related to movement. Detailed knowledge of origins, insertions, innervations, and actions of muscles will be presented. Students will select movements or exercises that utilize specific muscle groups and will analyze joint actions, muscle actions, and mechanical principles that apply to performance. *Prerequisite: BIOL 205 or 211. Spring.*

EXPH 300. Exercise Physiology
(4 credits)
(same as PHTH 300)
The discussion of the normal physiological responses to, and the recovery from, acute and chronic exercise stresses in the trained and untrained individual. The use of exercise as a means to assess fitness, improve fitness and the impact that conditions such as ageing, obesity and lack of physical activity have on health and fitness will be discussed. Specific laboratory activities will occur to assess student's overall fitness. Each of the following systems will be addressed: energy production, cardiovascular, neuromuscular and respiratory. *Prerequisites: Enrollment in physical therapy curriculum or those pursuing a minor in Exercise Physiology with permission of instructor; BIOL 111, 205, 206; CHEM 103, 104 or their equivalent. Fall.*

EXPH 305. Exercise Physiology I
(4 credits)
An overview of the effects of acute and chronic exercise and training on the neuromuscular and cardiorespiratory systems. An introduction to exercise testing and prescription by participation in weekly laboratory activities will introduce the student to fitness assessment, and the interpretation of data for the purpose of writing an individualized exercise prescription. Three hours lecture, and one 2-hour laboratory per week. *Prerequisites: BIOL 205, 206; CHEM 101, 102 or 103, 104 or equivalent. Fall.*

EXPH 310. Exercise Physiology II: Nutrition, Bioenergetics, Performance and Body Composition
(3 credits)
An examination of exercise nutrition and energy production from foods for health and performance; body composition, ergogenic aids, thermoregulation, eating disorders, and nutritional supplements will be discussed. *Prerequisites: EXPH 300 or EXPH 305. Spring.*

EXPH 312. Exercise Across the Lifespan
(3 credits)
An examination of the biology of aging from childhood through senescence and the effects exercise on the individual's fitness, performance and the activities of daily living. *Prerequisites: EXPH 300 or EXPH 305. Spring.*

EXPH 320. Biomechanics
(3 credits)
A detailed study of the musculoskeletal system and the application of muscle mechanics to sport and human movement patterns to include linear and angular kinematics and kinetics, loads and injuries of joints, fluid mechanics, and impacts with environmental objects. *Prerequisites: EXPH 250, 310; PHYS 104 or 121; MATH 112 or 121. Spring.*

EXPH 330. Neuromuscular Principals of Strength and Conditioning
(4 credits)
The scientific basis of strength training with special attention to the acquisition and expression of muscular strength/endurance. Contemporary training theories that address the modification of muscular strength, endurance, speed, power, and agility will be discussed. The student will develop expertise in the testing of muscular performance and exercise programming for optimal physical conditioning. *Three hours lecture and one 2 hour laboratory. Prerequisites: EXPH 300 or EXPH 305. Fall.*

EXPH 360. Exercise Testing & Prescription
(3 credits)
Principles of exercise testing to assess fitness and develop an exercise prescription to enhance fitness, improve health, and reduce risk factors in healthy and cardiac patients. The interpretation of clinical and exercise test data and the impacts of pharmacological interventions on exercise prescription will be discussed. *Prerequisites: EXPH 300 or EXPH 305. Fall.*

EXPH 390. Health & Fitness Programming
(2 credits)
The practical application of basic knowledge of exercise prescription to increase physical activity, enhance fitness, and reduce risk factors. The student will work with faculty and community mentors to develop individualized exercise prescriptions. Issues related to the administration of health and fitness facilities will also be introduced. *One hour lecture and three hours lab per week. Prerequisites: EXPH 102, 103, 205, 210, 250, and 310. Co-requisite: 330 or 360. Fall, Spring and Summer, as needed.*

EXPH 398/399. Internship/Practicum
(1-15 credits)
Capstone course that integrates classroom study with practical experience. The student will participate in didactic instruction and employment or service learning. Classroom periods will include discussion of the organization, administration and marketing of exercise programs and facilities. Credits will vary from one to 15 credits, but no more than 4 credits may be counted toward major requirements, with additional credits counted as free electives. *Open only to Exercise Physiology majors with the approval of Program Coordinator. Fall, Spring and Summer, as needed.*

EXPH 400. Advanced Laboratory and Field Methods in Exercise Physiology
(1-2 credits)
A competency-based laboratory course on commonly used field and laboratory testing devices for the purpose of fitness assessment, clinical analysis, collection of research data, and the improvement of sport performance. Techniques may include the use, maintenance, and calibration of equipment for hydrostatic weighing, skin fold determination, maximal and submaximal treadmill and ergometer testing, VO_{2max}, and ECG. *Prerequisites: EXPH 310.*

EXPH 405. Clinical Exercise Physiology for Special Populations
(3 credits)
Exercise prescription for those with medical conditions such as asthma, osteoarthritis, diabetes, cancer, and rheumatoid arthritis. *Pre-requisites: EXPH 310, 360. Spring.*

EXPH 410. Environmental Exercise Physiology
(3 credits)
Exercise in extreme environments, including heat/cold/humidity, the ocean, high altitudes, and space fight. *Pre-requisites: EXPH 310 or BIOL 406. Spring.*

EXPH 414. Special Topics Seminar in Children's and Women's Issues
(1 credit)
Discussion of the differential and unique effects of exercise on women and children. Topics may include pregnancy, menopause, bone health, and the female triad. *Prerequisites: EXPH 310, 312. Spring, even numbered years.*

EXPH 415. Special Topics Seminar in Cellular and Molecular Exercise Physiology
(1 credit)
Discussion of current research in cell and molecular biology related to exercise physiology. *Prerequisites: EXPH 310 or BIOL 401 or 405. Spring, odd numbered years.*

EXPH 498. Research
(1-4 credits)
Original investigation into a topic of the student's choice under the direction of a faculty member. Research is encouraged for all students interested in graduate study. *Open only to Exercise Physiology majors with the approval of Program Coordinator. Fall, Spring and Summer, as needed.*

EXPH 501. Independent Study in Exercise Physiology
(1-8 credits)