
Master of Science in Exercise Science
Department of Health, Leisure and Exercise Science
College of Fine and Applied Arts

Paul L. Gaskill, Chair and Professor
Ed.D., University of North Carolina at Greensboro
GaskillPL@appstate.edu

Charles L. Dumke, Program Director and Associate
Professor
Ph.D., University of Wisconsin-Madison
DumkeCL@appstate.edu

<http://www.hles.appstate.edu/>

The Department of Health, Leisure, and Exercise Science offers the Master of Science in Exercise Science (Major Code: 562*/31.0505), with three concentrations:

- Clinical/Cardiopulmonary Rehabilitation (562C)
- Research (562B)
- Strength and Conditioning (562D)

Courses in the following disciplines are offered through the Department of Health, Leisure, and Exercise Science:

- ES: exercise science
- RM: recreation management

NOTES:

1. During ES 5900 Internship, 50 “clinical” contact hours equals 1 s.h. credit.
2. If the ES 5999 Thesis option is chosen, students should be in preparation for prospectus approval by the 2nd Fall semester.
3. The total requirement for the degree is 42 s.h. minimum, but may be more depending upon elective hours.

The Strength and Conditioning concentration qualifies for **Academic Common Market** status, and students from the southeastern states outside of North Carolina may qualify for a reduction to in-state tuition. Students should contact their home state’s ACM coordinator to request consideration. The complete list of coordinators is available on the Southern Regional Education Board website: <http://www.sreb.org>.

PROGRAM OF STUDY FOR THE MASTER OF SCIENCE DEGREE IN EXERCISE SCIENCE (Major Code: 562*/31.0505)

Admission Requirements: Baccalaureate degree in from an accredited college or university; complete application to the Cratis Williams Graduate School (<http://www.graduate.appstate.edu>), including resume, three letters of recommendation, official GRE general exam scores, and official transcripts from all colleges attended. The following courses or equivalents must be completed prior to formal admission into the program: Human Anatomy and Physiology (ES 2000, 5 s.h.); Exercise Physiology (ES 2010, 3 s.h.); Introduction to Biomechanics (ES 3550, 4 s.h.). This list may not include prerequisites for all elective courses. The applicant must also have two additional science courses. Prerequisites will be assessed at the discretion of the graduate program director.

Basic Criteria for Consideration: Cumulative undergraduate GPA: 2.5 or higher; GRE Verbal + GRE Quantitative = 900 or higher; GRE Writing: 3.0 or higher.

Hours: 42 semester hours

Location: On Campus

Required Courses:

ES	5000	Introduction to Research Principles and Design	3
ES	5200	Exercise Science Seminar (1 s.h. each)	1+1=2
ES	5591	Biomechanical and Physiological Laboratory Assessment.....	3
ES	5592	Data Analysis in Sport and Exercise Science.....	3
ES	5621	Exercise Physiology I: Cardiopulmonary and Metabolic Aspects	3
ES	5622	Exercise Physiology II: Neuromuscular and Endocrinological Aspects.....	3
ES	5710	Biomechanics.....	3
REQUIRED HOURS.....			20

Concentration (CHOOSE ONE):**CLINICAL/CARDIOPULMONARY REHABILITATION CONCENTRATION (562C)**

ES	5625	Concepts of Clinical Exercise Testing	3
ES	5635	Electrocardiographic Interpretation	3
ES	5645	Cardiopulmonary Pathophysiology and Rehabilitation	3
ES	5660	Exercise Prescription and Chronic Disease Management	3
ES	5670	Clinical Exercise Practicum I	1-2
ES	5680	Clinical Exercise Practicum II	1-2
ES	5900	Internship	6

RESEARCH CONCENTRATION (562B)

ES	5999	Thesis.....	6
----	------	-------------	---

STRENGTH AND CONDITIONING CONCENTRATION (562D)

ES	5060	Practicum: Strength and Conditioning.....	3
ES	5555	Nutritional Aspects of Exercise and Sports.....	3
ES	5600	Survey of Sports Performance	3
ES	5650	Theoretical and Practical Aspects of Strength/Power Conditioning	3
ES	5900	Internship	3

Choose one of:

ES 5560	Research Project.....	3
ES 5999	Thesis.....	6

CONCENTRATION HOURS..... 6-22

Electives: (5000 level or above) with the advisor's approval..... 0-16

ELECTIVE HOURS 0-16

TOTAL HOURS FOR THE MS DEGREE (minimum) 42

Thesis: Optional

Proficiency: None required

Comprehensive: Required

Product of Learning: None required

GRADUATE COURSES IN EXERCISE SCIENCE (ES)

ES 5000. Introduction to Research Principles and Design/(3).F. The application of research principles to the management/administration of sport and exercise, the physiological responses associated with exercise, and the biomechanical assessment of movement and sport skills. Emphasis shall be placed on the appropriate application of research design and the utilization of scientific writing skills culminating in the development of a research prospectus. (Same as PE 5000.)

ES 5060. Practicum: Strength and Conditioning/(3).F. Practical application of scientific principles and concepts to physical conditioning programs. Students will participate in relevant practical activities involving or related to exercise science or sports medicine. Graded on an S/U basis.

ES 5200. Exercise Science Seminar/(1).S. This course will be open to first and second year graduate students in Exercise Science. Topics to be discussed will be in the field of exercise science and exercise physiology, and in other areas of interest to participating graduate students. Evaluation will be on participation, attendance and presentation quality. May be repeated one time for credit. Prerequisite: graduate student status.

ES 5500. Independent Study/(1-4).F;S.

ES 5530-5549. Selected Topics/(1-4).On Demand. Courses may include topics such as: adult fitness and cardiac rehabilitation; perceptual motor development; motor development; physical education for the handicapped; motor assessment and interpretation.

ES 5550. Seminar/(1).On Demand. An “exit course” for exercise science majors. Students will interact with faculty, peers, and professionals in related fields. Topics will focus on synergistic effects of subspecialties, vocational opportunities, vita writing and interviewing, and other current professional issues in preparation for post-graduate career development. Graded on an S/U basis. [Dual-listed with ES 4650.]

ES 5555. Nutritional Aspects of Exercise and Sports/(3).F;S. A study of nutrition specific to physical activity and sport performance. Topics will include metabolism during exercise, sport-related weight gain and loss, food and fluid intake for competition, nutritional ergogenic aids, exercise recovery nutrition, and various special topics. Prerequisites: ES 2000, ES 2010, ES 3450. Corequisite: CHE 2201. (Same as FCS 5555.) [Dual-listed with ES 4555.]

ES 5560. Research Project/(3).F;S. Selected broad research topical area of student’s choice concerned with conceiving and carrying to completion a research project. Each student will have an advisor for the research project and will present the findings to peers in a colloquium. (Same as PE 5560.)

ES 5591. Biomechanical and Physiological Laboratory Assessment/(3).S. An introductory graduate course to provide experiences in data acquisition and problem solving through a variety of physiological and biomechanical laboratory techniques; a basic overview of sampling/recording techniques will be presented.

ES 5592. Data Analysis in Sport and Exercise Science/(3).F. Methods of acquisition, analysis and interpretation of data most often encountered in sport and exercise science will be included. Emphasis will be placed on descriptive methods, statistical methods and computer applications. (Same as PE 5592.)

ES 5600. Survey of Sports Performance/(3).S. This course is designed to acquaint the student with a variety of non-Olympic, Summer and Winter Olympic sports. An overview of each sport will be presented by qualified instructors. Athletic profiles including physical, physiological, psychological and performance requirements will be discussed. Typical training programs for each sport will also be presented. Prerequisites: ES 2010 and ES 3450 or equivalent. Lecture three hours. [Dual-listed with ES 4600.]

ES 5621. Exercise Physiology I: Cardiopulmonary and Metabolic Aspects/(3).F. A study of bioenergetics and an in-depth analysis of the respiratory and cardiovascular responses to acute exercise as well as an examination of the adaptations observed in these systems as a result of physical training, rehabilitation, or disease. Prerequisite: ES 2010 or equivalent.

ES 5622. Exercise Physiology II: Neuromuscular and Endocrinological Aspects/(3).S. A study of the effects of exercise and training on the neuromuscular and endocrine systems. Examination of potential ergogenic aids on these systems. Prerequisites: ES 2010 and ES 5621.

ES 5625. Concepts of Clinical Exercise Testing/(3).F. This course provides experience in clinical exercise testing and interpretation for various chronic disease populations. Students will be required to perform a variety of clinical exercise tests commonly used in the assessment of various chronic diseases. Emphasis will be placed on the development of clinical skills required to provide safe and effective testing and the ability to accurately interpret results. Students will also be required to obtain community-based clinical observation hours. Prerequisites: ES 2010 (Exercise Physiology) and ES 3450 (Advanced Exercise Physiology) or similar coursework. [Dual-listed with ES 4625.]

ES 5635. Electrocardiographic Interpretation/(3).S. This course provides an analysis of electrocardiographic concepts of the normal and abnormal ECG. Topics will include rate, rhythm, hypertrophy, axis determination, atrial and ventricular arrhythmias, conduction defects, myocardial ischemia, and myocardial infarction. In addition, the use of ECG monitoring during diagnostic exercise testing will be discussed. This course will also introduce the student to competencies required by the American College of Sports Medicine for certification as an Exercise Specialist or a Registered Clinical Exercise Physiologist. Prerequisite: ES 3450 (Advanced Exercise Physiology) or equivalent. [Dual-listed with ES 4635.]

ES 5645. Cardiopulmonary Pathophysiology and Rehabilitation/(3).F. This course details the functions of the cardiovascular and respiratory systems emphasizing pathophysiology and treatment. Special reference will be made to exercise as a mode of therapy. Prerequisites: ES 2005 (Concepts in Fitness and Performance Evaluation) and ES 3450 (Advanced Exercise Physiology) or equivalent. [Dual-listed with ES 4645.]

ES 5650. Theoretical and Practical Aspects of Strength/Power Conditioning/(3).F. Includes brief overview of various biochemical and physiological systems. Provides a comprehensive comparative overview of the biochemical and physiological responses and adaptations of resistive training and aerobic exercise and training. Provides comprehensive study of training theory and methodologies with emphasis on enhancement of maximum strength, power, and high intensity exercise endurance. Prerequisite: ES 2010. [Dual-listed with ES 4000.]

ES 5660. Exercise Prescription and Chronic Disease Management/(3).S. This course presents a comprehensive overview of the physical, physiological and metabolic responses of the human body to exercise testing and training in healthy individuals and in those with metabolic, cardiovascular and/or pulmonary disease. The successful student will gain an understanding of the processes involved in prescribing safe and effective therapeutic exercise in healthy individuals as well as patients with cardiovascular (hypertension, atherosclerosis), metabolic (diabetes, thyroid, obesity, osteoporosis), pulmonary (asthma, emphysema), and musculoskeletal diseases/disorders. An overview of environmental and legal considerations in the prescriptive process will also be discussed. Prerequisites: ES 2010 (Exercise Physiology) and ES 3450 (Advanced Exercise Physiology) or equivalent. [Dual-listed with ES 4660.]

ES 5670. Clinical Exercise Practicum I/(1-2).S. This course will provide practical experience within several community-based clinical exercise settings. Students will be required to complete 50 contact hours within an approved clinical setting for each hour of credit. Potential clinical settings include cardiac and pulmonary rehabilitation, cardiac testing, pulmonary testing, cancer rehabilitation and pediatric exercise programming. Graded on an S/U basis. Prerequisite: ES 5625.

ES 5680. Clinical Exercise Practicum II/(1-2).F. This course will provide practical experiences within several community-based clinical exercise settings. Students will be required to complete 50 contact hours within an approved clinical setting for each hour of credit. Potential clinical settings include cardiac and pulmonary rehabilitation, cardiac testing, pulmonary testing, cancer rehabilitation and pediatric exercise programming. Graded on an S/U basis. Prerequisites: ES 5625 and ES 5670.

ES 5710. Biomechanics/(3).F. This represents an advanced graduate course in the science of human motion with emphasis on theory and application of quantitative analysis techniques. Skills will be developed in both kinetic and kinematic sampling/recording/ interpretation procedures. Prerequisite: graduate preparation in analysis of human motion.

ES 5900. Internship/(3-12).F;S. Graded on an S/U basis.

ES 5989. Graduate Research/(1-9).F;S. This course is designed to provide access to University facilities for continuing graduate research at the master's and specialist's levels. Graded on an S/U basis. ES 5989 does not count toward a degree.

ES 5999. Thesis/(2-6).F;S. Graded on an S/U basis.

GRADUATE COURSES IN RECREATION MANAGEMENT (RM)**RM 5530-5549. Selected Topics/(1-4).On Demand.**

RM 5560. Leisure and Aging/(3).S. This course focuses on the leisure needs and characteristics of the senior citizen. Programs and resources designed to service the leisure needs of this population will be examined. Focus will be on program planning and development to meet problems inherent in leisure delivery systems for seniors. [Dual-listed with RM 4560.]