

# EXERCISE SCIENCE (MS)

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Degree: Master of Science

## INTRODUCTION

The Master of Science degree program in Exercise Science (formerly *Health and Human Performance*) at Canisius University trains students in the areas of exercise as medicine, with an emphasis on clinical exercise science, health behaviors, pre-habilitation and strength and conditioning. This degree is appropriate for people who hope to work in corporate wellness, fitness training, clinical exercise physiology, human performance/strength and conditioning, or research settings. The program prepares students to practice in clinical settings as part of a health care team, or to work in exercise and health-promotion programs with apparently healthy or high-risk populations. This program also offers a solid platform to go on to doctoral studies. Finally, students have found this program to be helpful in preparing for medical school, physician assistant studies, occupational therapy or doctor of physical therapy programs.

Offered in a **ONLINE format**, the 33 credit hour MS program offers students the choice between an internship and a research (thesis) experience, the latter a preparation for doctoral programs.

The curriculum will provide students with appropriate course work and field experiences to prepare for the National Academy of Sports Medicine's (NASM) Performance Enhancement Specialization (PES), Corrective Exercise Specialization (CES), Behavior Change Specialist (BCS) and Certified Sports Nutrition Coach (CSNC) certification exams. There is also coursework geared towards preparing students for the Certified Strength and Conditioning Specialist (CSCS) exam offered by the National Strength and Conditioning Association (NSCA).

## ADMISSION

Applications are processed on a rolling basis and are considered as they are received for each term. We recommend submitting all materials required for admission at least 30 days prior to the start of the term you wish to begin. Earlier application will ensure the best scheduling options, as some course sections may become unavailable. Terms are fifteen weeks in length, and students may start in the fall, spring, or summer semesters. The online application can be submitted with no application fee.

To qualify for admission, all students must:

- Complete the graduate admissions application.
- Complete a baccalaureate degree from an accredited institution of higher learning with a minimum GPA of 2.70.
- Submit one (1) official undergraduate transcript from each institution attended with the degree posted from the degree-granting institution.
- Submit two (2) letters of recommendation.
- Provide evidence of sufficient college-level coursework in the areas of anatomy and physiology and exercise physiology. Students who do not meet prerequisites may be required to complete additional coursework.
- Provide a statement of purpose of approximately 500 words explaining your motivation for pursuing the MS in Exercise Science at Canisius

University. The statement may be submitted in the essay section of the graduate application.

**Transfer credit:** Previous graduate level transfer credits will be assessed on a case-by-case basis.

## PROGRAM DETAILS

### Academic Standing

Students must maintain a GPA of 3.00 to graduate from the program. If the GPA drops below 3.00, the student will be placed on academic probation. If the student does not bring his/her cumulative GPA above 3.00 by the end of the next term, the student may be dismissed from the program. A student may also be academically dismissed from the program by receiving more than 2 grades below B-.

### Curriculum

Code	Title	Credits
<b>Required Courses</b>		
KIN 502	Essentials of Performance Enhancement	3
KIN 506	Essentials of Corrective Exercise Training	3
KIN 507	Clinical Health Behavior Change	3
KIN 522	Exercise Psychology	3
KIN 565	Electrocardiography and Clinical Stress Testing	3
KIN 583	Advanced Movement Analysis	3
KIN 602	Clinical Exercise Science	3
KIN 615	Statistics in Exercise Science	3
KIN 622	Sports and Fitness Nutrition	3
KIN 680	Research Methods in Exercise Science	3
KIN 689 or KIN 603	Master's Project Internship I	3
<b>Total Credits</b>		<b>33</b>

## Roadmap

### 1 Year Roadmap for MS in Exercise Science

First Year	Spring	Summer
Fall KIN 502	KIN 506	KIN 603 or 689*
KIN 507	KIN 522	
KIN 602	KIN 565	
KIN 615	KIN 583	
KIN 622	KIN 680	

\* These may also be taken in any semester with approval of the internship supervisor or research advisor.

### 2 Year Roadmap for MS in Exercise Science

First Year	Spring
Fall KIN 502	KIN 506
KIN 507	KIN 522
KIN 615	KIN 680
<b>Second Year</b>	
Fall KIN 602	Spring KIN 565

KIN 622	KIN 583
KIN 603 or 689*	KIN 603 or KIN 689*

\* These may also be taken in any semester with approval of the internship supervisor or research advisor.

## Learning Goals and Objectives

**Learning Goal #1: Degree candidates in the M.S. program in Exercise Science will understand exercise and nutrition principles necessary to be competent and effective exercise physiologists.**

**STUDENTS WILL HAVE THE OPPORTUNITY TO:**

- 1.1 - Demonstrate principles of exercise and relate them to fitness development.
- 1.2 - Know and apply nutritional principles.
- 1.3 - Know the pathophysiology of common cardiovascular and pulmonary diseases as well as the mechanisms through which commonly used medications work to treat these diseases.

**Learning Goal #2: Degree candidates in the M.S. program in Exercise Science will safely and effectively assess patient status, evaluate fitness, and prescribe exercise.**

**STUDENTS WILL HAVE THE OPPORTUNITY TO:**

- 2.1 - Prescribe safe and effective exercise for a variety of populations, including healthy clients, athletes, and special populations.
- 2.2 - Demonstrate safe and proper use of clinical techniques and protocols to assess a client's fitness and/or clinical status. Create an appropriate sport-specific exercise prescription for an athlete.

**Learning Goal #3: Degree candidates in the M.S. program in Exercise Science will demonstrate appropriate dispositions in a professional setting.**

**STUDENTS WILL HAVE THE OPPORTUNITY TO:**

- 3.1 Exhibit personal attributes of dependability, preparedness, willingness to learn, and responsibility in a professional setting.

**Learning Goal #4: Degree candidates in the M.S. program in Exercise Science will demonstrate information literacy and critical thinking skills within their field of study.**

**STUDENTS WILL HAVE THE OPPORTUNITY TO:**

- 4.1 - Systematically analyze, evaluate, and critique a published, peer-reviewed article identifying threats to validity and weaknesses in methodology, as well as evaluating the appropriateness of statistical analysis used to derive conclusions.
- 4.2 - Design a quantitative research study related to their field of study with appropriate consideration given to ethical issues and appropriate controls for threats to validity.
- 4.3 - Use peer-reviewed journals and other reputable sources to develop an epidemiological argument as to whether a cause-and-effect relationship exists between a potential risk factor and a disease or other health outcome.

## Courses

**KIN 502 Essentials of Performance Enhancement 3 Credits**

This course is the application of program design for sport-specific clients. Students will be able to design cardiorespiratory training programs, power OPT™ programs, and programs for clients who participate in individual competition or team sports. Students will apply principles of reactive neuromuscular training (plyometric) and integrated speed training to help clients achieve their established goals. Students completing this course will be prepared to take National Academy of Sports Medicine's Performance Enhancement Specialization credentialing examination.

**Offered:** every fall.

**KIN 506 Essentials of Corrective Exercise Training 3 Credits**

This course will present an evidence-based approach to corrective exercise, the components of a comprehensive solution, and the practical know-how to develop and implement integrated strategies to improve common movement impairments. Students completing this course will be prepared to take National Academy of Sports Medicine's Corrective Exercise Specialist credentialing examination.

**Offered:** every spring.

**KIN 507 Clinical Health Behavior Change 3 Credits**

This course will explore health behavior theories to facilitate the adoption of healthful behaviors to various groups. It will include motivational interviewing, practice of nonverbal, active listening, goal assessment and group counseling. It will also explore the evaluation of nutrition education interventions.

**Offered:** every fall, online only.

**KIN 522 Exercise Psychology 3 Credits**

This course will cover topics such as eating disorders among athletes, female athlete triad, and weight management. It will provide students with skills to counsel athletes as well as sports teams. The course will also cover performance enhancement, motivation, and stress management of athletes. Students will develop an understanding of behavioral change theory as it relates to sports psychology.

**Offered:** every spring, online only.

**KIN 565 Electrocardiography and Clinical Stress Testing 3 Credits**

This course is designed to present the theoretical principles of electrocardiography. Topics include a review of cardiac physiology including the normal sequence of cardiac muscle depolarization and repolarization, determination of heart rate and rhythm, electrical axis and the diagnosis of cardiac rhythm in 12-lead ECG. Special emphasis will be placed on myocardial ischemia, myocardial infarction, treatment and clinical evaluation. Pharmacological interventions and the impact of the ECG, as well as exercise will be discussed.

**Offered:** every spring.

**KIN 583 Advanced Movement Analysis 3 Credits**

In this course, students will learn how to perform functional movement screens to evaluate movement patterns. Students will also learn how to interpret and analyze movement patterns to identify muscular weaknesses/ imbalances as well as areas where flexibility limits proper execution of a movement. Finally, students will learn to customize an exercise/stretching routine to address the limitations of the athlete to both improve their athletic performance and reduce the risk of injury.

**Offered:** every spring.

**KIN 602 Clinical Exercise Science 3 Credits**

Details the functions of the cardiovascular and respiratory systems emphasizing normal function, pathophysiology, initiation and progression of disease and current treatment. special reference will be made to the role of exercise as a therapeutic modality.

**Prerequisite:** an introductory course in anatomy and physiology.

**Offered:** every fall, online only.

**KIN 603 Internship I 3 Credits**

A supervised part-time internship in clinical and non-clinical exercise programs or in clinical exercise testing laboratories. Includes clinical exercise testing, exercise prescription and/or exercise leadership experiences.

Requires students to complete a minimum of 120 hours.

**Prerequisite:** permission of program director & associate dean.

**Offered:** fall, spring & summer.

**KIN 615 Statistics in Exercise Science 3 Credits**

Descriptive statistical methods including central tendencies, dispersion standard scores, correlation, and probability theory will be addressed. The elements of test construction: table of specifications, reliability, validity and item analysis will be considered. Candidates will become familiar with norm referenced, criterion referenced and performance instruments and will study the diagnostic teaching model of instruction. Technology will be used to simulate evaluation and statistical analysis.

**Offered:** every fall.

**KIN 622 Sports and Fitness Nutrition 3 Credits**

This course will focus on understanding the specific role of energy and nutrients in fitness and athletic performance. Additional topics will include the role of fluid and electrolytes, ergogenic aids, and special diets in physical activity. Tools for assessing body position (body fat, muscle mass), unique dietary concerns across the lifespan and in special population groups (heart disease, diabetes, obesity) and the effect of diet on endurance will be explored.

**Offered:** every fall, online only.

**KIN 680 Research Methods in Exercise Science 3 Credits**

Identification and delineation of research problems, survey of related literature and detailed examination of various research methods. Attention given to the presentation of research in both written and oral form.

**Offered:** occasionally.

**KIN 689 Master's Project 3 Credits**

The master's project is designed as a rigorous scholarly activity that provides an opportunity to integrate theoretical knowledge with research.

**Prerequisite:** permission of program director.

**Offered:** fall, spring & summer.