

Graduate Program Policy Statement

for the

Master of Science in Exercise Science

May, 2005

Part I. Historical Review

A. Purpose

The Master of Science in Exercise Science was created to provide a concentrated program of academic study for students interested in developing a deeper understanding of theory and applications related to the functioning of the human body during physical activity.

B. Evolution

The Master of Science in Exercise Science degree program was initiated as a Master of Science Degree in Physical Education in March 1972 on an experimental basis, with the mission of providing concentrated academic opportunities for those students interested in developing a deeper understanding of theory and applications related to the functioning of the human body during physical activity. The University Graduate Committee approved the experimental program for a period of three years, and the program received permanent status in November 1975.

In May 1988, the graduate program was evaluated by a panel of educators from other universities with established and reputable programs of graduate study in physical education. The evaluating team made a number of recommendations regarding course offerings, faculty assignments, admission practices, research and facilities.¹ To date, all of the team's recommendations have been addressed.

In 1998, a University-wide reorganization of academic units resulted in the merging of the College of Physical Education, Athletics, and Recreation with the College of Nursing and the Department of Nutrition. The new college was named the College of Health and Nursing Sciences, and the Department of Physical Education was renamed the Department of Health and Exercise Sciences. The Master's degree program offered through the Department of Health and Exercise Sciences and formerly known as the Master's in Physical Education degree program, was changed to the M.S. with a major in Exercise Science in 1999. In 2003 the departments of Health and Exercise Science and Nutrition and Dietetics merged to form the Department of Health, Nutrition, and Exercise Sciences and in 2005 the College was renamed the College of Health Sciences.

C. Degrees Offered

The graduate program in Exercise Science offers a Master of Science degree with a major in Exercise Science and concentrations in biomechanics, exercise physiology, motor control and sports medicine. Biomechanics is an interdisciplinary science that objectively interprets movement in living organisms. Emphasis is placed on techniques of measuring kinematic and kinetic characteristics of living organisms and on mathematical methods of analysis, with application in sports and rehabilitation. Exercise Physiology is a science that studies the effect of physical activity on the systems of the human body, with applications in physiological assessment, cardiac rehabilitation, and exercise prescription. Motor Control focuses on the development, acquisition and control of underlying processes responsible for movement. Emphasis may be placed on issues of motor behavior, development, learning and/or

¹Graduate Program Review of the College of Physical Education, Athletics and Recreation at the University of Delaware, John Billing, University of North Carolina, Richard Nelson, Pennsylvania State University, Robert Singer, University of Florida, May, 1988.

neuromuscular mechanisms. Sports Medicine is a branch of medicine concerned with injuries and illnesses associated with participation in athletic endeavors and physical activity. The field encompasses professionals with special expertise related to injury prevention, evaluation, treatment, and rehabilitation.

D. Administration and Faculty

The Exercise Science Graduate Program Committee administers the graduate program in Exercise Science. The Committee is composed of Exercise Science faculty members from the Department of Health, Nutrition, and Exercise Sciences. The Department Graduate Studies Committee provides oversight of all graduate programs and graduate curricula in the department.

Faculty members who teach graduate courses and advise graduate students in Exercise Science must have a doctorate or equivalent. In some instances, faculty members with a master's degree and special expertise in an area of Exercise Science as a result of concentrated study, employment experience, or service may be recommended for graduate teaching. In such cases, the faculty member must have a record of successful teaching in a specialized area of Exercise Science, proven scholarly ability, and the endorsement of the Chair of the Department of Health, Nutrition, and Exercise Sciences.

Part II. Admission Policy

A. University Policy on Admission

Admission to the graduate program is competitive. Those who meet stated minimum requirements are not guaranteed admission, nor are those who fail to meet all of those requirements necessarily precluded from admission if they offer other appropriate strengths.

B. University Admission Procedures

Applicants must submit all of the following items to the Office of Graduate Studies before admission can be considered:

A completed Admission Application should be submitted no later than January 15 for the fall semester and September 15 for the spring semester. Applicants should refer to the information given in the University catalog and/or check with the department for these dates and for other specific admission requirements. Admission application forms are available from the Graduate Office, from the department, and online (<http://www.udel.edu/admissions/appinfo.html>).

A \$60 nonrefundable application fee must be submitted with the application. Checks must be made payable to the University of Delaware. Applications received without the application fee will not be processed. Foreign students may utilize either a check or an International Postal Money Order to remit payment in U.S. currency.

Two official transcripts of previous college records must be sent directly from the institution to the Office of Graduate Studies. Students who have attended the University of Delaware need not supply a transcript from Delaware. Transcripts issued in a language other than English must be accompanied by an official translation into English. If the rank of the student is not displayed on the

transcript or diploma, departments may request an official letter of explanation and ranking from the institution where the degree was earned.

Applicants must submit at least three letters of recommendation indicating the capability, interest, maturity and scholarly potential of the candidate for graduate study. All letters of recommendation should be mailed to Dr. Michelle Provost-Craig, Graduate Coordinator, Department of Health, Nutrition, and Exercise Sciences, Human Performance Laboratory, University of Delaware, Newark, DE, 19716.

The Graduate Record Examination (GRE) admission test scores are required for admission into the Exercise Science graduate degree program.

International student applicants must demonstrate a satisfactory level of proficiency in the English language if English is not their first language. The Test of English as a Foreign Language (TOEFL) is offered by the Educational Testing Service in test centers throughout the world. The University requires departments to use an official paper-based TOEFL score of 550 or better for an applicant to be considered for admission. In addition, departments may elect to require that the applicant provide a score from the TSE (Test of Spoken English). TOEFL scores and TSE/SPEAK scores more than two years old cannot be validated or considered official. International students must be offered admission to the University and provide evidence of adequate financial resources before a student visa will be issued. The University has been authorized under federal law to enroll nonimmigrant alien students. The University has more than 500 international graduate students enrolled from more than 96 countries. International students are required to purchase the University-sponsored insurance plan or its equivalent.

It is a Delaware State Board of Health Regulation and a University of Delaware mandate that all entering graduate students born after January 1, 1957 give proof of proper immunization for measles, mumps, and rubella. If immunization requirements are not met, the student will not be eligible to register. Specific information may be obtained from the Student Health Service (302) 831-2226.

C. Specific Requirements for Admission into the Exercise Science Graduate Program

The Exercise Science Graduate Program Committee makes admission decisions. Students will be admitted to the program based upon enrollment availability and their ability to meet the following recommended entrance requirements.

- Baccalaureate degree from an accredited college or university
- A GRE score of 1050 on combined math and verbal sections
- A undergraduate GPA of 3.0 or higher
- Acceptance by a primary advisor

Recommended prerequisites for Biomechanics include:

- Math through calculus
- Anatomy
- One year of physics
- Computer programming experience

Recommended prerequisites for Exercise Physiology include:

- One year of biology
- Two years of chemistry
- One year of physics

Recommended prerequisites for Motor Control include:

- Math through calculus
- Anatomy and physiology
- One year of biological or physical science

Recommended prerequisites for Sport Medicine include:

- Anatomy and physiology
- One year of biological or physical science
- One year of experience (clinical or research) with orthopaedic or sensorimotor pathology

D. Admission Application Processing

The admission process is completed as follows: First, completed applications consisting of the application form, undergraduate/graduate transcripts, official GRE scores, three letters of recommendation, and the written statement of goals and objectives are reviewed by the Exercise Science Graduate Program Committee. If the student is admissible, the application is circulated to all appropriate Exercise Science faculty in an effort to match the student with a faculty advisor. Faculty members tend to advise students whose background, goals, and objectives are compatible with their own areas of research and funding. Admissible applicants are formally admitted into the program once a faculty member has agreed to accept the applicant as an advisee.

Applications are processed as they are submitted. However, students wishing to be considered for graduate funding must complete the application process no later than January 15 of the preceding year. The Graduate Program Committee typically requires a period of one month to process completed applications.

E. Admission Status

Students admitted into the Exercise Science graduate program may be admitted into one of three categories.

- 1) **Regular.** Regular status is offered to students who meet all of the established entrance requirements, who have a positive record of scholarship in their fields of specialization, and who have the ability, interest, and maturity necessary for successful study at the graduate level in a degree program.
- 2) **Provisional.** Provisional status is offered to students who are seeking admission to the degree program but lack one or more of the specified requirements for admission. All provisional requirements must be met within the deadline given before regular status can be granted. Students

admitted with provisional status are generally not eligible for assistantships or fellowships. Students who file an application during the final year of undergraduate or current graduate work and are unable to supply complete official transcripts showing the conferral of the degree will be admitted pending conferral of the degree if their records are otherwise satisfactory and complete.

3) Visiting Student Scholars. Visiting scholar admission is offered to students who wish to transfer graduate credits to another institution. Visiting students must submit a letter from their graduate dean or registrar certifying that they are graduate students in good standing at another institution. Such letters will be accepted in lieu of the transcripts and GRE scores which are required of all other applicants. Visiting scholar status is gradually limited to a period of two years and is a non-degree status. If visiting students desire to transfer to regular status at the University of Delaware, they must meet the stated admissions standards. Admission as a visiting student implies no commitment about later admission as a regular student or about transferability of courses from the student's original institution.

Part III. Degree Requirements for the Master of Science with a major in Exercise Science

A. Course Requirements

The Master of Science with a major in Exercise Science requires 24 credits of coursework at the 600 or 800 level, and 6 credits of thesis. The 24 credits of coursework are specified in the individual planned programs of study, and must include 15-18 credits of coursework in courses within Exercise Science, and 6-9 credits of coursework in cognate areas as specified by the requirements for each concentration.

Students in the Master's degree program are allowed to take a maximum of six credits of independent study. Additional independent study credits will not count towards graduation.

A maximum of 9 graduate credit hours may be transferred from another institution to the degree.

Candidates for the degree must have regular status.

B. Revisions to Planned Program of Study

Students who wish to make changes to their program of study must first obtain permission from their advisor. The advisor must then make a written request to the Graduate Program Committee to revise the program of study.

C. Regulations Governing Theses

1) *Establishment of Thesis Committee:* The student and his/her advisor will create a thesis committee at the time the student begins to develop the thesis proposal. The thesis committee shall consist of at least two University faculty from within the Department of Health, Nutrition, and Exercise Sciences, and at least one additional faculty member from inside or outside of the Department. The definition of University faculty shall include professional staff members who

hold secondary faculty appointments within the department. Faculty who have retired or resigned from the University may continue to chair committees of students whose work began under their direction prior to their retirement or departure from the University. Individuals who do not meet the above stated definition given for faculty status may co-chair the thesis committee provided that the other co-chair meets the definition for faculty status. Outside faculty shall include individuals not affiliated with the M.S. in Exercise Science program. These may be individuals from outside of the University who are nationally recognized for their expertise in the area of study specified by the thesis. The Graduate Program Committee must approve committee members from outside of the University. It is the responsibility of the thesis advisor to replace members who withdraw from the committee during the thesis process.

- 2) *Defense of the Thesis Proposal:* The format of the thesis must adhere to guidelines specified in the University's Thesis and Dissertation Manual. The manual is available electronically on the Web at <http://www.udel.edu/provost/thesismanual/htmlformat/contents.html> , or it may be purchased at the University Bookstore. A copy of the thesis proposal must be delivered to each faculty that houses Department faculty at least one week prior to the proposal defense. A copy of the thesis proposal must be delivered to the members of the thesis committee at least one week in advance of the proposal defense. Proposals that involve the use of human subjects must receive approval from the University Institutional Review Board (IRB). Details for creating consent forms and submitting studies for review by the IRB can be obtained from the Office of Research.

All Department faculty and students will be invited to the thesis proposal defense. The candidate will present a summary of the proposed research, and will then address questions from the committee, attending faculty, and invited guests. After all questions have been addressed, the thesis committee will meet privately to decide whether the proposal is accepted, rejected, or accepted with stipulations. Details of the meeting will then be presented to the student. A majority of committee votes will decide the outcome. In the event of a split vote, the decision to accept or reject the thesis proposal will rest with the thesis advisor.

Thesis committee members should sign the final copy of the approved proposal. A signed copy of the approved thesis proposal should be forwarded to the Exercise Science Graduate Coordinator. Students who fail the thesis proposal defense will receive one additional opportunity to repeat the process and defend a new or modified thesis proposal.

- 3) *Defense of the Thesis:* The format of the thesis must adhere to the University's Governing Thesis and Dissertation Manual. This document is available on the University's website at <http://www.udel.edu/provost/thesismanual/htmlformat/contents.html>, or it may be purchased at the University Bookstore. Thesis content and organization should be appropriate for the journal(s) in which the thesis is targeted for publication with additional literature review materials contained in an appendix. A copy of the thesis must be delivered to the members of the thesis committee at least one week in advance of the defense.

All Department faculty and graduate students will be invited to the thesis defense. The candidate will present a summary of the completed research, and will then address questions from the committee, attending faculty, and invited guests. After all questions have been addressed, the thesis committee will meet privately to decide whether the thesis is accepted, rejected, or accepted pending revisions. Details of the meeting will then be presented to the student. A majority of committee votes will decide the outcome. In the event of a split vote, the decision to

accept or reject the thesis will rest with the thesis advisor. Students must pass the thesis defense in no more than two attempts in order to complete the requirements for the Master of Science degree with a major in Exercise Science.

Master's theses are due in the Office of Graduate Studies six weeks prior to the date of degree conferral.

- 4) *Processing the Final Document*: Three copies of the thesis must be approved by the chair of the student's advisory committee, the Chair of the Department of Health, Nutrition, and Exercise Sciences, the Dean of the College of Health Sciences, and the Vice Provost for Academic and International Programs. A separate abstract and abstract approval page must be submitted with the thesis. The thesis must be submitted to the Office of Graduate Studies for approval not later than six weeks prior to the degree conferral date.

The University reserves the right to duplicate a thesis for distribution to other libraries or for the use of individual scholars. However, the University will not publish a thesis for general distribution without the written consent of the author. If copyrighting of a master's thesis is desired, it must be done by direct application to the Copyright Office in Washington, D.C. Published works are eligible for copyright protection in the United States if the work is first published in the United States.

Part V. Fellowship, Scholarship and Assistantship Policy

A. Terms and Conditions

Eligibility for initial employment as a Graduate Assistant in the Department of Health, Nutrition, and Exercise Sciences requires the following:

1. Regular admission into the master's program in Exercise Science, and
2. Ability to teach or otherwise provide assistance in an area of program need.

The Graduate Program Committee shall make recommendations to the Department Chair, who shall make the final determination of employment.

The term of employment shall normally be two years. However, continuing employment during that two year period shall be contingent upon the following:

1. Satisfactory teaching performance, as determined by the Department Chair following consultation with the Activity Program Director and/or the supervising faculty.
2. Maintenance of at least a 3.0 GPA over all courses taken, and
3. Satisfactory, regular progress toward the master's degree in Exercise Science.

B. Workload Assignment

The Department Chair shall make assignment of Graduate Assistant duties on a semester-by-semester basis. Duties assigned shall represent a time-wise commitment by the Graduate Assistant of no more than 20 hours per week. Responsibilities may include teaching classes in the University's Lifetime Activity Program, teaching lecture classes, and/or teaching laboratory classes in the

undergraduate Health, Nutrition, and Exercise Sciences Program. Other ongoing and incidental duties may also be assigned. Specific responsibilities for Graduate Assistants teaching activity, lecture, and laboratory classes are listed below.

Weekly Responsibilities for Graduate Assistants Assigned to an Activity Class:

Preparation	*1.5 hrs.
Read and know background content materials	
Formulate lesson plans	
Pick up needed equipment (and return equipment at end of class)	
Contact time	3.0 hrs.
Deliver introductory lecture to class	
Organize and supervise student activities	
Answer student questions and troubleshoot	
Provide a wrap-up session at the end	
Preparing and grading exams (averaged over semester)	0.5 hrs.
TOTAL.....	5.0 hrs.

*In the case of an assignment involving multiple sections of the same class, 2.0 total hours of preparation time per week shall be considered sufficient for all sections.

Weekly Responsibilities for Graduate Assistants Assigned to a lecture Class:

Preparation	2-3.0 hrs.
Read and know background content materials	
Formulate lesson plans	
Contact time	2-3.0 hrs
Formulate lesson plans	
Deliver lecture to class	
Facilitate class discussion, problem solving	
Organize and supervise student activities	
Answer student questions and troubleshoot	
Grading Quizzes/Exams -assignments	4.0 hrs.
TOTAL	8-10.0 hrs.

Weekly Responsibilities for Graduate Assistants Assigned to a Laboratory Class:

Preparation	1.5 hrs.
Read and know background content materials	
Meet with faculty instructor to review previous week's lab session and discuss plans for the current week's laboratory experiences	
Plan organizational format for laboratory session	
Set up needed equipment (and properly store equipment at end of class)	
Contact time	2.0 hrs.
Return graded lab reports or quizzes	
Deliver introductory lecture to class	
Organize and supervise student activities	
Answer student questions and troubleshoot	
Provide a wrap-up session at the end	
Grading Lab Reports and Quizzes	4.0 hrs.
(First time, also attend lectures)	2.0 hrs.

TOTAL**7.5-9.5 hrs.**

*In the case of an assignment involving multiple sections of the same class, 2.0 total hours of preparation time per week shall be considered sufficient for all sections.

B. Other Responsibilities

Graduate Assistants shall also be expected to perform other duties at the request of the Department Chair or Activity Program Director, which may include, but are not limited to the following:

1. Cover classes for absent instructors,
2. Assist with special events in which the program is participating, and
3. Assist the Activity Program Director or supervising faculty for a laboratory class or with other activities as needed.
4. Work under the supervision of a faculty member in a department research laboratory by mutual agreement of the Department Chair and the supervising faculty member.

Part VI. General Information Relevant to Master's Candidates**A. Graduate Course Numbering System.**

Graduate credit may be earned for courses numbered 600 to 699, 800 to 898, and 900 to 998. (Courses numbered 600 to 699 are graduate-level courses open to qualified, advanced undergraduates by permission of the instructor.)

B. Application for Advanced Degree.

To initiate the process for degree conferral, candidates must submit an "Application for Advanced Degree" to the Office of Graduate Studies. The application deadlines are February 15 for spring candidates, May 15 for summer candidates, and September 15 for winter candidates. The candidate's adviser and Department Chair must sign the application. There is an application fee of \$35 for master's degree candidates and a \$95 fee for doctoral degree candidates. Payment is required when the application is submitted.

C. Graduate Grade Point Average.

Students must have a minimum overall cumulative grade point average of 3.0 to be eligible for the degree. In addition, the grades in courses applied toward the degree program must equal at least 3.0. All graduate-numbered courses taken with graduate student classification at the University of Delaware are applied to the cumulative index. Credit hours and courses for which the grade is below "C-" do not count toward the degree even though the grade is applied to the index. Candidates should see that their instructors have submitted all final grades. Temporary grades of "S" (Satisfactory) are assigned for 868 (Research) and 869 (Master's Thesis) until a final letter grade is submitted upon the completion of the thesis or dissertation.

D. Time Limits for the Completion of Degree Requirements.

Time limits for the completion of degree requirements begin with the date of matriculation and are specifically expressed in the student's letter of admission. The University policy for students entering a master's degree program is ten consecutive semesters to complete the degree requirements. Students completing the requirements for the master's degree who are subsequently granted permission to continue toward the doctoral degree are given an additional ten consecutive semesters. Students who change their degree plan and have transferred from one degree program to another degree program are given ten consecutive semesters from the beginning of the first year in the latest program.

E. Extension of the Time Limit.

An extension of time limit may be granted for circumstances beyond the student's control. Requests for time extensions must be made in writing and approved by the student's advisory committee and the Exercise Science Graduate Coordinator. The department will forward the request to the Office of Graduate Studies. The Office of Graduate Studies will determine the student's eligibility for a time extension and will notify the student in writing of its decision to grant an extension of time.

F. Sustaining Status for Candidates Pursuing Thesis/Dissertation Degree Option.

Once a graduate student has completed all required course credits needed for the degree (including six credits of Master's thesis [869]) and all other degree requirements except the submission of thesis, the student is required to maintain his/her matriculation in the degree program during the fall and spring semesters by registering for Master's Sustaining: Thesis (UNIV 899). All students, including sustaining students, are required to be registered in the semester in which the degree is officially awarded. Sustaining registration is required for summer session if the student completes the degree in summer session. (Sustaining registration is never required for winter session as graduate degrees are not awarded at the conclusion of winter session.)

G. Transfer of Credit Earned as a Continuing Education Student at the University of Delaware.

Students who complete graduate credits with the classification of CEND (Continuing Education Non-degree) at the University of Delaware may use a maximum of 9 graduate credits earned with this classification toward their graduate degree. The CEND credits, grades, and quality points become a part of the student's academic record and grade point average. CEND credit can be transferred provided that: (a) the course was at the 600-800 level, (b) the course was taken within the time limit appropriate for the degree, (c) the course was approved by the student's adviser and the chair of the student's major department, and (d) the course was in accord with the specific degree program as specified by the unit's Graduate Program Policy Statement.

H. Transfer of Credit from Another Institution.

Graduate credit earned at another institution will be evaluated at the written request of the student. Such a request should be directed to the student's major department using a Request for Transfer of Graduate Credit form. A maximum of 9 credits required for the degree will be accepted provided that such credits: (a) were earned with a grade of no less than B-, (b) are approved by the student's

adviser and the chair of the student's major department, (c) are in accord with the specific degree program of the student as specified by the unit's Graduate Program Policy Statement, (d) are not older than five years, and (e) were completed at an accredited college or university. The credits, but not the grades or quality points, are transferable to University of Delaware graduate records. Graduate courses counted toward a degree received elsewhere may not be used. Credits earned at another institution while the student was classified as a continuing education student at that institution are not eligible to be transferred to one's graduate degree at the University of Delaware. Credits from institutions outside of the United States are generally not transferable to the University of Delaware.

I. Transfer of Credit from the Undergraduate Division at the University of Delaware.

Students who wish to transfer credits from their undergraduate record to their graduate record may transfer a limited number by arranging with the department to have these courses approved by their instructors before the courses are taken. These courses must be at the 600-level, and the student must perform at the graduate level. They must be in excess of the total required for the baccalaureate degree, must have grades of no less than B-, and must not be older than five years. The credits, grades, and quality points will transfer.

J. Credit for "Special Problem" Course Taken as a Graduate Student.

Some 400-level courses may be completed for graduate credit if the graduate student does additional work. Students must register for the course at the graduate level using the departmental number of 666. For example, a graduate student who attends PSYC 425 and fulfills additional graduate level requirements to earn graduate credit should register for PSYC 666, not PSYC 425. The student may process a titling form for the 666 numbered course.

K. Expiration of Credit.

Course credits expire five years after the course has been completed.

APPENDIX A
Concentration Areas

**Master of Science in Exercise Science
Concentration: Exercise Physiology**

Exercise Physiology is a science that studies the effect of physical activity on the systems of the human body. Opportunities are available in scientific research, physiological assessment, cardiac rehabilitation, and exercise prescription. Students in the MS program in exercise physiology are required to conduct research and complete a thesis.

Credit Requirements

Credits within Exercise Science	15-18	
Cognate areas outside Exercise Science	6-9	
Thesis	<u>6</u>	
<i>Total number of required credits</i>	<u>30</u>	
A. Required Credits Within Exercise Science		
HESC 601 Research Methods	3	
HESC 602 Statistics	3	
HESC 603 Seminar in Exercise Science (4 semesters required)	0	
HESC 800 Advanced Physiology of Exercise	3	
HESC 804 Clinical Measures in Ex Phys	3	
At least one of the following courses		
HESC 675 Cardiovascular Assessment II	3	
HESC 802 Human Cardiovascular Control	<u>3</u>	
<i>Total from Area A</i>	<i>15-18</i>	
B. A minimum of 2 courses from the following:		
HESC 665 Cardiovascular Assessment I	3	
HESC 650 Life Span Motor Development	3	
HESC 675 Advanced Exercise Prescription	3	
HESC 666 Special Problem	1-6	
HESC 807 Motor Learning and Control	3	
IFST 605 Impact of Aging on the Family		3
BISC 675 Cardiopulmonary Physiology	3	
BISC 605 Advanced Mammalian Physiology	4	
STAT 615 Design and Analysis of Experiments	3	
STAT 617 Multivariate Methods	<u>3</u>	
<i>Total from Area B</i>	<i>6-9</i>	
C. HESC 869 Thesis in Exercise Physiology	<u>6</u>	
<i>Total from Area C</i>	<u>6</u>	

**Master of Science in Exercise Science
Concentration: Biomechanics**

Biomechanics is an interdisciplinary science that objectively interprets movement in living organisms. Emphasis is placed on techniques of measuring kinematic and kinetic characteristics of living organisms and on mathematical methods of analysis. Students in the MS program in biomechanics are required to conduct research and complete a thesis.

Credit Requirements

Credits within Exercise Science	15-18
Credits in Cognate Areas	6-9
Thesis	<u>6</u>
<i>Total number of required credits</i>	<u>30</u>
A. Courses Required Within Exercise Science	
HESC 601 Research Methods	3
HESC 602 Statistics	3
HESC 603 Seminar in Exercise Science (4 semesters required)	0
HESC 690 Biomechanical Methods	3
HESC 689 Laboratory Instrumentation	3
At least one of the following courses	
HESC 687 Seminar in Biomechanics	3
HESC 688 Electromyographic Kinesiology	<u>3</u>
<i>Total Credits from Area A</i>	<i>15-18</i>
B. A minimum of 2 courses from the following:	
BMSC 601 Mathematics for Signal Processing	3
HESC 650 Life Span Motor Development	3
HESC 691 Gait Laboratory Internship	3
HESC 800 Advanced Physiology of Exercise	3
HESC 807 Motor Learning and Control	3
MEEG 612 Biomechanics of Human Movement	3
STAT 615 Design and Analysis of Experiments	3
STAT 617 Multivariate Methods	3
EDST 861 Introduction to Statistical Inference	3
EDST 862 Principles of Experimental Design	3
PHYT 604 Functional Anatomy/Biomechanics	3
PHYT 613 Advanced Orthopedics	<u>3</u>
<i>Total Credits from Area B</i>	<i>6-9</i>
C. HESC 869 Thesis in Biomechanics	
<i>Total Credits from Area C</i>	<u>6</u>

Master of Science in Exercise Science
Concentration: Motor Control

Motor Control focuses on the theoretical and applied aspects of development, acquisition and control of underlying processes responsible for movement skills across the life span. Emphasis is placed on developing skills and interdisciplinary knowledge in order to conduct research which may include issues of behavior, development, learning and/or neuromuscular mechanisms. Students selecting Motor Control as an area of concentration are required to write a thesis.

Credit Requirements

Credits within Exercise Science	15-18
Credits in Cognate Areas	6-9
Thesis	<u>6</u>
<i>Total number of required credits</i>	<i>30</i>
A. Courses Required Within Exercise Science	
HESC 601 Research Methods	3
HESC 602 Statistics	3
HESC 603 Seminar in Exercise Science (4 semesters required)	0
HESC 807 Motor Learning and Control	3
HESC 651 Neurophysiological Basis of Human Movement	3
At least one of the following courses	
HESC 657 Seminar in Motor Behavior	3
HESC 808 Seminar in Motor Control	<u>3</u>
<i>Total Credits from Area A</i>	<i>15-18</i>
B. A minimum of 2 courses from the following:	
HESC 650 Life Span Motor Development	3
HESC 666 Independent Study	3
HESC 803 Introduction to Lab Instrumentation	3
HESC 690 Biomechanical Methods	3
STAT 615 Design and Analysis of Experiments	3
STAT 617 Multivariate Methods	3
EDUC 861 Introduction to Statistical Inference	3
EDUC 862 Principles of Experimental Design	3
EDUC 863 Learning and Development	3
PSYC 612 Human Psychophysiology	3
PSYC 626 Neuroscience I	<u>3</u>
<i>Total Credits from Area B</i>	<i>6-9</i>
C. HESC 869 Thesis in Motor Control	<u>6</u>
<i>Total Credits from Area C</i>	<i>6</i>

Master of Science in Exercise Science
Concentration: Sports Medicine

Sports Medicine is a branch of medicine concerned with injury and illnesses associated with participation in athletic endeavors and physical activity. The field encompasses professionals with special expertise related to injury prevention, evaluation, treatment, and rehabilitation. Students selecting Sports Medicine as an area of concentration are required to write a thesis.

Credit Requirements

Credits within Exercise Science	15-18
Credits in Cognate Areas	6-9
Thesis	6
<i>Total number of required credits</i>	<i>30</i>

A. Courses Required Within Exercise Science

HESC 601	Research Methods	3
HESC 602	Statistics	3
HESC 603	Seminar in Exercise Science (4 semesters required)	0
HESC 604	Sensorimotor Characteristics of Injury	3
HESC 605	Pathoetiology of Musculoskeletal Injury	3
HESC 606	Evidence-Based Sports Medicine	<u>3</u>
<i>Total Credits from Area A</i>		<i>15</i>

C. A minimum of 3 courses from the following list:

(at least 2 courses must come from the same cognate area)

HESC 666	Special Problem	3
HESC 840	Advanced Human Anatomy	3
<i>Motor Control</i>		
HESC 607	Motor Learning and Control	3
HESC 650	Life Span Motor Development	3
HESC 651	Neurophysiological Basis of Human Movement	3
HESC 808	Seminar in Motor Control	3
<i>Biomechanics</i>		
HESC 688	Electromyographic Kinesiology	3
HESC 689	Laboratory Instrumentation	3
HESC 690	Biomechanical Methods	3
HESC 687	Seminar in Biomechanics	3
<i>Exercise Physiology</i>		
HESC 675	Exercise Testing and Prescription	3
HESC 800	Advanced Physiology of Exercise	3
HESC 804	Clinical Measures in Ex Phys	3
HESC 665	Cardiovascular Assessment I	3
HESC 802	Human Cardiovascular Control	3

Research Design and Statistics

BISC 667 Seminar (Research design and Statistics) 3

STAT 615 Design and Analysis of Experiments 3

STAT 617 Multivariate Methods 3

EDUC 861 Introduction to Statistical Inference 3

EDUC 862 Principles of Experimental Design 3

Total Credits from Area B 9

C. HESC 869 Thesis in Sports Medicine 6

Total Credits from Area C 6