

# Exercise Physiology

IN THE SCHOOL OF EXERCISE AND NUTRITIONAL SCIENCES  
IN THE COLLEGE OF HEALTH AND HUMAN SERVICES

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## Faculty

**Matthew T. Mahar**, Ed.D., Professor of Exercise and Nutritional Sciences, Director of School

**Michael J. Buono**, Ph.D., Professor of Exercise and Nutritional Sciences

**David M. Kahan**, Ph.D., Professor of Exercise and Nutritional Sciences

**Susan S. Levy**, Ph.D., Professor of Exercise and Nutritional Sciences

**Larry S. Verity**, Ph.D., Professor of Exercise and Nutritional Sciences, Associate Dean of the College of Health and Human Services

**Daniel T. Cannon**, Ph.D., Assistant Professor of Exercise and Nutritional Sciences

**Jochen Kressler**, Ph.D., Assistant Professor of Exercise and Nutritional Sciences

## Associateships and Assistantships

Graduate teaching associateships are available for a limited number of qualified students. These provide essential education, technical training, and creative experience necessary for future professional and scholarly activity or college-level teaching. Graduate assistantships are also available in some cases to aid faculty research. Applications and additional information on graduate programs may be obtained from the School of Exercise and Nutritional Sciences website at <http://ens.sdsu.edu>.

## General Information

The School of Exercise and Nutritional Sciences offers graduate study leading to the Master of Science degree in exercise physiology and a concurrent graduate program leading to a Master of Science degree in nutritional science and Master of Science degree in exercise physiology. The major objective of the concurrent graduate program is to offer preparation in the interrelated fields of nutritional science and exercise physiology. In order to be granted permission to enroll in coursework leading to completion of the didactic program in dietetics (accredited by the Accreditation Council for Education in Nutrition and Dietetics), students admitted to the Master of Science degree in nutritional sciences, or the concurrent Master of Science degree in nutritional science and Master of Science degree in exercise physiology, must have completed all of the following (or equivalent courses) with a GPA of 3.1 or better: Biology 100, 100L, 211, 211L, 212, 336; Chemistry 100, 130, 160; and a statistics course (e.g. Psychology 280).

The Master of Science degree in exercise physiology has strong theoretical and practical components that provide a basis for students who anticipate employment in the field of rehabilitative and/or preventive exercise, as well as for those who intend to pursue a doctoral degree in exercise science. The faculty includes researchers who are professionally active in areas of study such as thermoregulation, nutrition and metabolism, exercise and aging, cardiac and metabolic pathophysiology, and environmental physiology. The school provides the students an opportunity to gain exercise-related experience under the close supervision of faculty. Graduate students learn pragmatic skills, such as physiological testing, exercise training, and participant education in the field of preventive and clinical exercise programming.

## Admission to Graduate Study

All applicants must submit admissions materials separately to SDSU Graduate Admissions and to the School of Exercise and Nutritional Sciences.

### Graduate Admissions

The following materials should be submitted as a complete package directly to:

**Graduate Admissions**  
Enrollment Services  
San Diego State University  
San Diego, CA 92182-7416

1. Official transcripts (in sealed envelopes) from all postsecondary institutions attended;

#### NOTE:

- Students who attended SDSU need only submit transcripts for work completed since last attendance.
  - Students with international coursework must submit both the official transcript and proof of degree. If documents are in a language other than English, they must be accompanied by a certified English translation.
2. GRE scores (<http://www.ets.org> SDSU institution code 4682);
  3. English language score, if medium of instruction was in a language other than English (<http://www.ets.org> SDSU institution code 4682).

## Master of Science Degree in Exercise Physiology

### General Information

The Master of Science degree in exercise physiology provides students with science courses in exercise physiology along with clinical application. The faculty are active researchers in areas of study to include thermoregulation and environmental physiology, fatigue and exercise intolerance, nutrition and metabolism, and respiratory control in healthy and diseased populations. Students learn laboratory skills and the physiological explanation of responses to exercise, and are provided the opportunity to gain exercise-related research experience under close faculty supervision.

### Admission to the Degree Curriculum

All students must satisfy the general requirements for admission to the university with classified graduate standing as described in Part Two of this bulletin. In addition, a student applying for admission to the graduate program in exercise physiology must meet the following requirements.

1. A bachelor's degree. Applicants who do not have an undergraduate major in kinesiology or related discipline may be admitted to conditionally classified graduate standing on the recommendation of the graduate adviser of the school. Students will be required to complete or have equivalent preparation in Biology 212, 336, Exercise and Nutritional Sciences 303, 304, 304L, and an undergraduate statistics course.
2. A grade point average (GPA) of at least 3.0 in the last 60 units of coursework.
3. A minimum score of 475 (old GRE score) or 151 (new GRE score) on the verbal and 475 (old GRE score) or 142 (new GRE score) on the quantitative sections of the GRE General Aptitude Test.

Students will be admitted ONLY in the fall semester.

**Advancement to Candidacy**

All students must satisfy the general requirements for advancement to candidacy, as described in Part Four of this bulletin.

**Specific Requirements for the Master of Science Degree**

(Major Code: 08355) (SIMS Code: 556521)

In addition to meeting the requirements for classified graduate standing, the student must satisfy the basic requirements for the master's degree, as described in Part Four of this bulletin. The 36-unit program includes a minimum of 29 units of 500-, 600-, 700-, and 800-level coursework in the School of Exercise and Nutritional Sciences. No more than six units of 500-level coursework with the approval of the graduate adviser will apply to the program of study. The remaining units must be selected from courses listed in this bulletin as acceptable for master's degree programs. Students complete the degree by choosing either Plan A or Plan B. If students select Plan A, Exercise and Nutritional Sciences 799A (Thesis) is required for completion of the degree, accompanied by a final oral examination in the field of the thesis and on the implications of the thesis research for the broader field of exercise physiology. If students select Plan B, Exercise and Nutritional Sciences 790 (Seminar in Directed Readings) is required for completion of the degree.

Students are required to develop and sign a formal plan of study which must be approved by both a faculty adviser and the graduate adviser. This official program of study is developed when the student has completed between 12 and 21 units of study, and must be filed with the Division of Graduate Affairs as a prerequisite for advancement to candidacy.

The school expects the student to complete the degree within seven years. Failure to complete the degree requirements within seven years will result in dismissal from the program.

Required courses (36 units):

DPT 750	Concepts in Physiology, Pathophysiology, and Pharmacology .....	4
DPT 830	Cardiopulmonary Therapeutics.....	4
ENS 601	Experimental Methods in Exercise and Nutritional Sciences.....	3
ENS 602	Research Evaluation in Exercise and Nutritional Sciences.....	3
ENS 632	Physiological Chemistry of Exercise .....	3
ENS 661	Seminar in Advanced Physiology of Exercise .....	3
ENS 662	Advanced Exercise Physiology Laboratory .....	3
ENS 796	Exercise Specialist Internship.....	1-3 (Cr/NC)
ENS 799A	Thesis or Project .....	3 (Cr/NC/RP)

**OR**

ENS 790	Seminar in Directed Readings.....	3 (Cr/NC)
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Electives: Seven units to be selected with approval of graduate adviser.

**Master of Science Degree in Nutritional Science and Master of Science Degree in Exercise Physiology**

**Admission to the Degree Curriculum**

All students must satisfy the general requirements for admission to the university with classified graduate standing as described in Part Two of this bulletin. In addition, a student applying for admission to the concurrent program in nutritional science and exercise physiology must meet the following requirements.

1. A grade point average (GPA) of at least 3.0 overall or at least 3.0 in the last 60 units of baccalaureate coursework.

2. A bachelor's degree in foods and nutrition, exercise science, kinesiology, physical education, or related fields. Students will be required to complete or have equivalent preparation in Biology 212, 336, Chemistry 100, 130, 160, Nutrition 201, 302, 302L, and Exercise and Nutritional Sciences 303, 304, 304L, and an undergraduate statistics course.
3. A minimum score of 475 (old GRE score) or 151 (new GRE score) on the verbal and 475 (old GRE score) or 142 (new GRE score) on the quantitative sections of the GRE General Aptitude Test.

Students will be admitted ONLY in the fall semester.

**Advancement to Candidacy**

All students must satisfy the general requirements for advancement to candidacy, as described in Part Four of this bulletin.

**Specific Requirements for the Master of Science in Nutritional Science and Master of Science in Exercise Physiology**

(Major Code: 08356) (SIMS Code: 552990)

In addition to meeting the requirements for classified graduate standing and the basic requirements for the master's degree as described in Part Four of this bulletin, the student must complete an officially approved course of study of not less than 48 units as outlined below. Also, students complete their degree by choosing either Plan A or Plan B. In Plan A, students will include Nutrition 799A (thesis) or Exercise and Nutritional Sciences 799A (thesis) for completion of their degree, accompanied by a final oral examination on the field of the thesis and on the implications of the thesis research for the broader field of exercise and nutritional sciences. If students select Plan B, Exercise and Nutritional Sciences 790 (Directed Readings) is required for completion of the degree.

DPT 750	Concepts in Physiology, Pathophysiology, and Pharmacology .....	4
DPT 830	Cardiopulmonary Therapeutics.....	4
ENS 601	Experimental Methods in Exercise and Nutritional Sciences.....	3
ENS 602	Research Evaluation in Exercise and Nutritional Sciences.....	3
ENS 661	Seminar in Advanced Physiology of Exercise. 3	
ENS 662	Advanced Exercise Physiology Laboratory .....	3
ENS 796	Exercise Specialist Internship.....	3 (Cr/NC)
NUTR 600	Seminar: Foods and Nutrition.....	3
NUTR 607	Child Nutrition .....	3
NUTR 608	Geriatric Nutrition .....	3
NUTR 610	Nutrition and Energy .....	3
NUTR 700	Seminar in Nutrition .....	3

**Plan A**

NUTR 799A	Thesis .....	3 (Cr/NC/RP)
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**OR**

ENS 799A	Thesis .....	3 (Cr/NC/RP)
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**or Plan B**

ENS 790	Seminar in Directed Readings.....	3 (Cr/NC)
Electives:	Seven units to be selected with approval of graduate adviser.	

If a student, after entering the concurrent program leading to a Master of Science degree in nutritional science and a Master of Science degree in exercise physiology returns to a single degree program, all the requirements for the single degree program must then be met.

The school expects the student to complete the degree requirements within seven years. Failure to complete the degree requirements within seven years will result in dismissal from the program.

## Courses Acceptable for Master's Degree Programs (ENS)

Refer to *Courses and Curricula and Regulations of the Division of Graduate Affairs* sections of this bulletin for explanation of the course numbering system, unit or credit hour, prerequisites, and related information.

### Exercise and Nutritional Sciences (ENS) UPPER DIVISION COURSE

#### ENS 596. Selected Topics in Exercise and Nutritional Sciences (1-3)

Selected topics in exercise and nutritional sciences. May be repeated with new content and approval of instructor. See *Class Schedule* for specific content. Limit of nine units of any combination of 296, 496, 596 courses applicable to a bachelor's degree. Maximum credit of six units of 596 applicable to a bachelor's degree. Credit for 596 and 696 applicable to a master's degree with approval of the graduate adviser.

### Exercise and Nutritional Sciences (ENS) GRADUATE COURSES

#### ENS 601. Experimental Methods in Exercise and Nutritional Sciences (3)

Prerequisite: Undergraduate statistics course.  
Experimental methods in exercise and nutritional science.

#### ENS 602. Research Evaluation in Exercise and Nutritional Sciences (3)

Prerequisite: Exercise and Nutritional Sciences 601.  
Techniques in designing, conducting, and reporting research in exercise and nutritional science. Qualitative and quantitative paradigms examined. Ethical consideration of human research.

#### ENS 632. Physiological Chemistry of Exercise (3)

Prerequisite: Exercise and Nutritional Sciences 661.  
Biochemical and metabolic responses of the human body to acute and chronic exercise. Neuroendocrine control of fuel regulation during exercise.

#### ENS 659. Exercise Cardiology and Pathology (3)

Prerequisites: Exercise and Nutritional Sciences 304 and 304L.  
Interpretation of resting and exercise electrocardiograms with cardiopulmonary pathologies that skew interpretations.

#### ENS 661. Seminar in Advanced Physiology of Exercise (3)

Prerequisites: Exercise and Nutritional Sciences 303 and 304.  
Advanced aspects of the physiology of exercise. Effects of exercise on human beings in relation to health, longevity, morphology and performance.

#### ENS 662. Advanced Exercise Physiology Laboratory (3)

Nine hours of laboratory.  
Prerequisites: Exercise and Nutritional Sciences 304, 304L, and admission to program in Exercise Physiology.

Laboratory course designed to develop competency in respiratory metabolism pulmonary function, gas analysis, blood chemistry and ergometry. Experience in the application of exercise procedures with human subjects and analysis and interpretation of results.

#### ENS 666. Adult Fitness: Exercise Prescription (3)

Prerequisites: Exercise and Nutritional Sciences 304 and 304L.  
Physical conditioning programs for the prevention, rehabilitation, and control of diseases associated with aging adults. Topics include disease etiology, health/disease evaluation, and exercise prescription for apparently healthy and diseased adults.

#### ENS 696. Advanced Topics in Exercise and Nutritional Sciences (3)

Intensive study in specific areas of exercise and nutritional sciences. May be repeated with new content. See *Class Schedule* for specific content. Credit for 596 and 696 applicable to a master's degree with approval of the graduate adviser.

#### ENS 790. Seminar in Directed Readings (3) Cr/NC

Prerequisites: Exercise and Nutritional Sciences 602 and advancement to candidacy.

Preparation for comprehensive examination for students pursuing an M.S. degree under Plan B.

#### ENS 796. Exercise Specialist Internship (1-3) Cr/NC

Three hours of laboratory per unit.  
Prerequisites: Exercise and Nutritional Sciences 662 and Doctor of Physical Therapy 830.

Supervised application of exercise laboratory testing, test interpretation, exercise prescription and exercise leadership in adult fitness, corporate fitness, preventive medicine and/or hospital disease rehabilitation setting.

#### ENS 798. Special Study (1-3) Cr/NC/RP

Prerequisite: Consent of school director.  
Individual study. Maximum credit six units applicable to a master's degree.

#### ENS 799A. Thesis or Project (3) Cr/NC/RP

Prerequisites: An officially appointed thesis committee and advancement to candidacy.  
Preparation of a project or thesis for the master's degree.

#### ENS 799B. Thesis Extension (0) Cr/NC

Prerequisite: Prior registration in Thesis or Project 799A with an assigned grade symbol of RP.

Registration required in any semester or term following assignment of RP in Course 799A in which the student expects to use the facilities and resources of the university; also student must be registered in the course when the completed thesis or project is granted final approval.

#### ENS 799C. Comprehensive Examination Extension (0) Cr/NC

Prerequisite: Completion or concurrent enrollment in degree program courses.

Registration required of students whose only requirement is completion of the comprehensive examination for the master's degree. Registration in 799C limited to two semesters.

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### Finance

Refer to "Business Administration" in this section of the bulletin.