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# Exercise Physiology

**OFFICE: Exercise and Nutritional Sciences 351**  
**TELEPHONE: (619) 594-5541**

In the Department of Exercise and Nutritional Sciences  
In the College of Professional Studies and Fine Arts

## Faculty

B. Robert Carlson, Ph.D., Professor of Exercise and Nutritional Sciences, Chair of Department  
Michael J. Buono, Ph.D., Professor of Exercise and Nutritional Sciences  
Jeanne F. Nichols-Bernhard, Ph.D., Professor of Exercise and Nutritional Sciences  
Patricia Patterson, Ph.D., Professor of Exercise and Nutritional Sciences (Graduate Adviser)  
Anthony A. Sucec, Ed.D., Professor of Exercise and Nutritional Sciences  
Larry S. Verity, Ph.D., Professor of Exercise and Nutritional Sciences  
Fred W. Kolkhorst, Ph.D., Associate Professor of Exercise and Nutritional Sciences

## Associateships

Graduate teaching associateships in exercise and nutritional sciences are available to a limited number of qualified students. Application blanks and additional information may be secured from the chair of the department or the graduate adviser.

## General Information

The Department 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 M.S. 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.

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 department also has an adult fitness program which provides the students an opportunity to gain exercise-related experience with apparently healthy adults of all ages. Moreover, under the close supervision of faculty, graduate students learn pragmatic skills, such as comprehensive physiological testing, exercise training, and participant education in the field of preventive and clinical exercise programming.

## Master of Science Degree in Exercise Physiology

### Admission to Graduate Study

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 in kinesiology. Applicants who do not have an undergraduate major in kinesiology may be admitted to conditionally classified graduate standing on the recommendation of the departmental graduate adviser. Students will be required to complete or have equivalent preparation in Biology 212, 336, Exercise and Nutritional Sciences 303, 304, 314, and an undergraduate statistics course in addition to the minimum 36 units required for the Master of Science degree.
2. A grade point average (GPA) of at least 3.0 in the last 60 units of coursework.
3. A minimum score of 475 on each of the verbal and quantitative sections of the GRE General Test.

Students will be admitted ONLY in the fall semester. Submit applications no later than April 1.

### Advancement to Candidacy

All students must satisfy the general requirements for advancement to candidacy, as described in Part Two of this bulletin. Nine units of coursework in the official program must remain after advancement to candidacy.

### Specific Requirements for the Master of Science Degree

**(Major Code: 08355)**

In addition to meeting the requirements for classified graduate standing, the student must satisfy the basic requirements for the master's degree, described in Part Two of this bulletin. The 36-unit program includes a minimum of 30 units in Exercise and Nutritional Sciences. The remaining units must be selected from courses listed in this bulletin as acceptable on master's degree programs. At least 27 units of the 36-unit program must be in 600- and 700- numbered courses. A final oral examination on the field of the thesis and on the implications of the thesis research for the broader field of exercise physiology is also required.

Students must 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 Graduate Division as a prerequisite for advancement to candidacy.

The department expects a 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):

ENS 601 Experimental Methods in Exercise and Nutritional Science (3)

ENS 602 Research Evaluation in Exercise and Nutritional Science (3)

ENS 632 Physiological Chemistry of Exercise (3)

ENS 659 Exercise Cardiology and Pathology (3)

ENS 661 Seminar in Advanced Physiology of Exercise (3)

ENS 662 Advanced Exercise Physiology Laboratory (3)

ENS 666 Adult Fitness: Exercise Prescription (3)

ENS 668 Adult Fitness: Exercise Leadership and Administration (3)

ENS 796 Exercise Specialist Internship (3) Cr/NC

ENS 799A Thesis (3) Cr/NC/SP

Electives (6 units): Electives 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 Graduate Study**

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 in the last 60 units of 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 302, 302L, and either Nutrition 204 or 311, and Exercise and Nutritional Sciences 303, 304, 314, and an undergraduate statistics course.
3. A minimum score of 475 on each of the verbal and quantitative sections of the GRE General Test.

Students will be admitted ONLY in the fall semester. Submit applications no later than April 1.

#### **Advancement to Candidacy**

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

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

**(Major Code: 08356)**

In addition to meeting the requirements for classified graduate standing and the basic requirements for the master's degree as described in Part Two of this bulletin, the student must complete an officially approved course of study of not less than 48 units as outlined below.

ENS 601 Experimental Methods in Exercise and Nutritional Science (3)

ENS 602 Research Evaluation in Exercise and Nutritional Science (3)

ENS 632 Physiological Chemistry of Exercise (3)

ENS 659 Exercise Cardiology and Pathology (3)

ENS 661 Seminar in Advanced Physiology of Exercise (3)

ENS 662 Advanced Exercise Physiology Laboratory (3)

ENS 666 Adult Fitness: Exercise Prescription (3)

ENS 668 Adult Fitness: Exercise Leadership and Administration (3)

ENS 796 Exercise Specialist Internship (3) Cr/NC

ENS 798 Special Study (2) Cr/NC/SP

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)

NUTR 798 Special Study (1) Cr/NC/SP

ENS 799A Thesis (3) Cr/NC/SP

**OR**

NUTR 799A

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. A final oral examination in the field of the thesis and its implications to the broader fields of nutritional science and exercise physiology is also required.

The department 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 on Master's Degree Programs**

##### **UPPER DIVISION COURSE**

##### **Exercise and Nutritional Sciences Course**

##### **596. Selected Topics in Exercise and Nutritional Sciences (1-3) I, II**

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 or master's degree. Maximum combined credit of six units of 596 and 696 applicable to a 30-unit master's degree.

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**GRADUATE COURSES**

**Exercise and Nutritional Sciences Courses**

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

Prerequisite: Undergraduate statistics course.

Experimental methods in exercise and nutritional science. (Formerly numbered Exercise and Nutritional Sciences 585, 586, 792.)

**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. (Formerly numbered Exercise and Nutritional Sciences 585, 586, 792.)

**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. (Formerly numbered Physical Education 632.)

**659. Exercise Cardiology and Pathology (3)**

Prerequisites: Exercise and Nutritional Sciences 304 and 314.

Interpretation of resting and exercise electrocardiograms with cardiopulmonary pathologies that skew interpretations. (Formerly numbered Physical Education 659.)

**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. (Formerly numbered Physical Education 661.)

**662. Advanced Exercise Physiology Laboratory (3)**

Nine hours of laboratory.

Prerequisites: Exercise and Nutritional Sciences 304, 314, 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. (Formerly numbered Physical Education 662.)

**666. Adult Fitness: Exercise Prescription (3)**

Prerequisites: Exercise and Nutritional Sciences 304 and 314.

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. (Formerly numbered Physical Education 666.)

**668. Adult Fitness: Exercise Leadership and Administration (3)**

One lecture and six hours of laboratory.

Prerequisite: Exercise and Nutritional Sciences 666.

Administration of and role of exercise programs in preventive medicine, corporate fitness, and Phase I, II, and III of cardiac rehabilitation, and other disease rehabilitation. Development of skills in exercise leadership in traditional and experimental exercise programs for the apparently healthy and diseased adult. (Formerly numbered Physical Education 668.)

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

Three hours of laboratory per unit.

Prerequisites: Exercise and Nutritional Sciences 659, 662, 668.

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. (Formerly numbered Physical Education 796.)

**For additional courses applicable to the Master of Science degree in exercise physiology see:**

Exercise and Nutritional Sciences 696: Advanced Topics in Exercise and Nutritional Sciences

Exercise and Nutritional Sciences 798: Special Study

Exercise and Nutritional Sciences 799A: Thesis or Project

Exercise and Nutritional Sciences 799B: Thesis Extension