Exercise Science

Department of Exercise and Nutrition Sciences

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Overview

The undergraduate program in exercise science (ES) is designed to give students a strong knowledge base in physiological, anatomical, biomechanical, and nutritional aspects of human physical activity. Students can choose tracks in general ES, exercise nutrition or pre-physical therapy. The formal lecture/laboratory sequence of courses, coupled with a one-semester internship experience, prepares graduates for entry-level positions focusing on rehabilitation, prevention of injury and disease, community health and wellness or performance enhancement. Many students find employment as a direct result of the internship experience. The ES program is also the entry point for the doctoral program in physical therapy (DPT). Students interested in the DPT program are required to complete only the 1st year of the upper-level professional sequence in the ES program. The 4-yr ES program is also excellent preparation for entry into professional courses of study in other health professions, such as medicine, public health, chiropractic, or physician's assistant. Additionally, we offer five-year combined Bachelors/Masters programs in 2 areas; Exercise Science/Nutrition Science and Exercise Science/Public Health.

About our Degrees

The undergraduate program in Exercise Science (ES) is designed to give students a strong knowledge base in physiological, biomechanical, and nutritional aspects of human physical activity. Students can choose a general ES program or specialize in exercise nutrition or pre-physical therapy. Six credits of electives coupled with an internship experience enable students to concentrate in a particular area of interest. For more information visit our Web site.

The formal lecture/laboratory sequence of courses in the four-year program, coupled with a one-semester internship experience, prepares graduates for entry-level positions focusing on rehabilitation, prevention of injury and disease, and/or performance enhancement. The ES program is also the entry point for the doctorate in physical therapy (DPT). Students can apply to the DPT program in the first year of the upper division of the ES program.

Acceptance Criteria - BS

Minimum overall GPA of 2.0.
Minimum GPA of 2.5 in prerequisite courses (44-46 credit hours).

Acceptance Criteria - BS/MS, BS/MPH, and Pre-PT

Completion of general education requirements.

Pre-PT and BS/MPH: Minimum GPA of 3.0 in prerequisite courses.
BS/MS: Minimum GPA of 2.8 in the last 60 credits. To continue in the MS portion, students must have an overall undergraduate GPA of 3.0 as of the beginning of the fall semester, Fourth year.

Acceptance Information

Deadline: January 31
Number of applicants for Promotion to Professional Sequence (2011): 160
Number promoted to Professional Sequence (2011): 120
Total number currently enrolled in Professional Sequence (junior/senior level courses): 195

Degree Requirements

Please see Degrees and Policies.

About our Courses

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Certain upper level lecture courses may have 100-200 students while other lecture courses, laboratories, and recitations have 80-90 students.

For course descriptions, please see Courses.

Acceptance Information

Acceptance into the program is a two-step process. Students are initially accepted into the prerequisite sequence of courses as freshmen and are designated as ES majors. Students can also enter the major at any time from other majors at UB or as undecided majors, provided they are on track to complete prerequisite courses. Students who transfer to UB from another institution for the purpose of completing prerequisite courses will be granted intended ES major status. The second step of the acceptance process requires that all students submit a Promotion to Professional Sequence form by the last academic day in January of the year in which they plan to complete the prerequisite sequence. In order to advance to the professional sequence of courses, students should have a minimum overall GPA of >2.0 and an ES prerequisite GPA of >2.5. Promotion to professional sequence is competitive and is limited to 120 students.

Note: Accepted AP courses will be counted in the ES prerequisite GPA as follows: 5=A, 4=B, 3=C.

To be eligible for the pre-PT track and the BS/MPH program, students must have a minimum prerequisite GPA of 3.0 and no grade in prerequisite courses below C. To be eligible for the BS/MS program in Exercise Science/Nutrition, students must have a GPA of 2.8 in the last 60 credits and no prerequisite grades below C. To continue in the MS portion, students must have an overall undergraduate GPA of 3.0 as of the beginning of the fall semester, Fourth year. Students can also be accepted into the BS/MS program in exercise and nutrition sciences as freshmen if they enter UB either in the honors or academic excellence programs and meet the requirements to remain in that program. These students will still be required to complete the Promotion to Professional Sequence Application.

Extracurricular Activities

The Exercise Science Club - for information, contact the department (716-829-2941).

See the UB Student Association.

Practical Experience and Special Academic Opportunities

Independent Study and Internships

Practicums and independent studies are highly recommended and internships are required. Independent studies, practicums, and internships enable students to concentrate in a specific area of interest and to gain valuable work experience. Many students find employment as a direct result of the internship experience.

Career Information and Further Study

The Exercise Science program prepares graduates for entry-level jobs in the areas of fitness, health and wellness, prevention of injury and rehabilitation through exercise and physical activity. Students apply scientific principles of conditioning and the ability to design a safe lifestyle program, including healthy exercise habits.

Skills gained in this program include:

Managing, organizing and meeting deadlines, analyzing, critical thinking, teaching, interpreting, communicating, persuading/influencing, coordinating, planning, and guiding people towards wellness.

Career Choices

Graduates are prepared for entry-level positions that focus on rehabilitation, prevention of injury and disease, performance enhancement, and exercise nutrition.

Alumni of Exercise Science have found employment in the following fields:

- Cardiopulmonary rehabilitation (hospitals, clinics)
- Chiropractic*

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- Health and Wellness (corporate, community, commercial
- Medicine*
- Personal fitness training
- Physical therapy*
- Special education*
- Strength and conditioning programs (collegiate and professional level)

**Graduates from the Exercise Science program are not eligible for employment in some of the above areas without further schooling.*

Work settings include:

Entry-level exercise science positions can be found in commercial, agency, corporate, hospital, clinical and recreational settings, including health clubs and community centers, special interest groups such as Olympic training centers and professional sports teams, personal consulting, and educational institutions.

Salary Information

Salaries range greatly from one occupation, position, and work setting to another. Graduates can improve their marketability by earning specialized certifications, such as those administered by the American College of Sports Medicine and the National Strength and Conditioning Association.

What percentage of graduates goes on to find related employment?

30% obtain entry-level positions

What percentage of graduates goes on to graduate school?

70% either to graduate school or to a variety of other professional programs

Career Hints

Although a master's degree is not needed for employment in this field, management and leadership positions usually require a degree beyond the bachelors.

Graduates of the program have pursued graduate education in exercise physiology, exercise science, biomechanics, management, special education, business administration, medicine, physical therapy, public health, chiropractic, podiatry, nutrition, and physician assistant programs.

Employers are seeking candidates with experience and those who have developed their skills from that experience. Internships, part-time or summer employment, and/or further education can enhance a graduate's employability in their chosen career area.

Graduates are ideal candidates for additional degrees in the following areas:

- Biomechanics
- Chiropractic
- Exercise physiology
- Health promotion
- Medicine
- Nursing
- Nutrition
- Physical therapy
- Physician assistant programs

Degrees Offered

Undergraduate: BS
Combined Degrees: BS/MS; BS/MPH

Links to Further Information About this Program

- Undergraduate Catalog
- Undergraduate Admissions
- Graduate Admissions
- Department of Exercise Science
- School of Public Health and Health Professions

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Acceptance Criteria

Four-Year Program
Minimum overall GPA of 2.0.
Minimum GPA of 2.5 in prerequisite courses (44-46 credit hours).

Pre-PT
Completion of general education requirements.
Minimum GPA of 3.0 in prerequisite courses.
Minimum grade of C in all prerequisite courses.

Advising Notes

Students are encouraged to see an academic advisor for more specific information regarding BS/MS, BS/MPH, and DPT programs.

Graduation Requirements for BS
Completion of all general education requirements.
Minimum GPA of 2.0 overall.
Minimum GPA of 2.0 in ES courses plus 6 credits of approved electives.

Prerequisite Courses

ANA 113/ES 113 Human Anatomy; OR APY 345 Comparative Primate Anatomy and APY 346 Dissections in Comparative Primate Anatomy
CHE 101 General Chemistry
CHE 102 General Chemistry
ES 200 Science of Human Movement
MTH 121 Survey of Calculus and Its Applications I or MTH 141 College Calculus I
NTR 108 Human Nutrition
PGY 300 Human Physiology
PHY 101 College Physics I
PHY 151 College Physics I Lab
PHY 102 College Physics II
PHY 152 College Physics II Lab
PSY 101 Introductory Psychology
STA 119 Statistical Methods

Required Courses

ANA 407 Gross Human Anatomy
ES 300 Theory of Athletic Injury I
ES 310 Exercise Assessment, Prescription, and Programming I
ES 330 Lifespan Physiology
ES 340 Physical Activity for Special Cases
ES 341 Critical Analysis of Scientific Literature
ES 342 Neuroscience I
ES 343 Neuroscience II
ES 370 Biomechanics I
ES 380 Exercise Physiology
ES 402 Exercise Nutrition
ES 410 Exercise Assessment, Prescription, and Programming II
ES 429 Internship (must be taken for a total of 12 credit hours)
ES 442 Applications in Exercise Science
ES 450 Professional Development
ES 468 Epidemiology and Public Health for Health Professions
Electives

Summary
Total required credit hours for the major...107

See Baccalaureate Degree Requirements for general education and remaining university requirements.

Recommended Sequence of Program Requirements

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Four-Year Program
Note: Students are not required to follow this specific sequence. Sequencing of courses should be based on the student's strengths and individual preferences.

FIRST YEAR
Fall CHE 101; MTH 121 or MTH 141; PSY 101
Spring CHE 102, NTR 108, STA 119

SECOND YEAR
Fall ANA 113*, PHY 101/PHY 151
Spring PGY 300, PHY 102/PHY 152, ES 200

**Anatomy requirement can instead be satisfied by taking APY 345/APY 346 in the spring of the sophomore year.*

SUMMER BEFORE THIRD YEAR
ANA 407

THIRD YEAR
(YEAR 1 OF EXERCISE SCIENCE PROFESSIONAL SEQUENCE PROGRAM)
Fall ES 300, ES 310, ES 342, ES 380, ES 341
Spring ES 330, ES 343, ES 370, ES 442, electives

FOURTH YEAR
Fall ES 340, ES 402, ES 410, ES 450, ES 468, electives
Spring ES 429 (must be taken for a total of 12 credit hours)

Electives and Course Groupings

Students must choose 6 credits of electives from the following:
BCH 403 Biochemical Principles**
BIO 201 Cell Biology
BIO 205/BIO 215 Fundamentals of Biological Chemistry/Laboratory**
CHE 201 Organic Chemistry w/Lab or CHE 203 Organic Chemistry
CHE 202 Organic Chemistry w/Lab or CHE 204 Organic Chemistry
ES 344 Neuroanatomy I*
ES 345 Neuroanatomy II*
ES 428 Health Promotion, Prevention and Wellness
ES 496 Practicum (1-3 credits)
ES 475 Musculoskeletal Injury
ES 497 Honors Research
ES 499 Independent Study (1-4 credits)
MIC 301 Fundamentals of Microbiology
MT 401 Clinical Biochemistry**
NTR 301 Dietary Assessment
NTR 401 Nutrition and Health
NTR 402 Nutrition in the Life Cycle
OT 217 Medical Terminology
PGY 412 Applied Physiology
PGY 451 Human Physiology I
PGY 452 Human Physiology II
PHI 337/SSC 337 Social and Ethical Values in Medicine
PMY 302 Introduction to Pharmacology
PSY 322 Abnormal Psychology
PSY 325 Health Psychology
PSY 336 Developmental Psychology
PSY 351 Biopsychology
PSY 438 Sport and Exercise Psychology
* For students in Pre-DPT track only.
** Students can only use one Biochemistry course towards their electives.

Exercise Science And Nutrition - B.S./M.S.

Acceptance Criteria

Honors or UB scholars can be accepted as freshmen into the B.S./M.S. in Exercise and Nutrition Science but must complete the Promotion

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to Professional Sequence (PPS) application for the Exercise Science - Nutrition Concentration. Other students must apply to the BS/MS Program by using the Promotion to Professional Sequence (PPS) application for the Exercise Science - Nutrition Concentration.

To convert to graduate student status, the student MUST submit the supplemental on-line application at http://sphhp.buffalo.edu/ens/esnutrition/applying.php by the first academic day in March of their Third year.

Prerequisite Courses

ANA 113 OR ES 113 Human Anatomy; OR APY 345 Comparative Primate Anatomy and APY 346 Dissections in Comparative Primate Anatomy
CHE 101 General Chemistry
CHE 102 General Chemistry
ES 200 Science of Human Movement
MTH 121 Survey of Calculus and Its Applications I or MTH 141 College Calculus I
NTR 108 Human Nutrition
PGY 300 Human Physiology
PHY 101 College Physics I
PHY 151 College Physics I Lab
PHY 102 College Physics II
PHY 152 College Physics II Lab
PSY 101 Introductory Psychology
STA 119 Statistical Methods

Required Courses

ANA 407 Gross Human Anatomy
CHE 203 Organic Chemistry
CHE 204 Organic Chemistry
ES 310 Exercise Assessment and Prescription
ES 340 Physical Activity for Special Cases
ES 341 Critical Analysis of Scientific Literature
ES 342 Neuroscience I
ES 343 Neuroscience II
ES 370 Biomechanics
ES 380 Exercise Physiology
ES 410 Exercise Assessment & Prescription II
ES 496 Practicum
NTR 301 Dietary Assessment
NTR 402 Lifecycle Nutrition
One biochemistry course (one of the following: BCH 403, BIO 205, MT 401)
3 credits of Exercise Science undergraduate electives
NTR 500 Energy and Protein
NTR 501 Vitamins & Minerals
NTR 503 Nutrition and Health
NTR 505 Exercise Nutrition
NTR 600 Pathophysiology
NTR 630 Seminar (two semesters)
NTR 675 Project in Nutrition
NTR 676 Selected Readings
NTR 680 Research (2 credits)
PGY 551 Human Physiology
PGY 552 Human Physiology
One 500/600-level statistics course
9 credits of 500/600-level electives

Summary
Total required credit hours for undergraduate portion...96
Total required credit hours for BS/MS...132

See Baccalaureate Degree Requirements for general education and remaining university requirements.

Refer to the Graduate School's Policies and Procedures Manual for requirements for master's degree candidates.

Recommended Sequence of Program Requirements

FIRST YEAR
Fall CHE 101; MTH 121 or MTH 141; PSY 101
Spring CHE 102; STA 119; NTR 108

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SECOND YEAR
Fall ANA 113*, PHY 101/PHY 151
Spring PGY 300, PHY 102/PHY 152, ES 200

**Anatomy requirement can also be satisfied by taking APY 345/APY 346 in the spring of the sophomore year.*

SUMMER BEFORE THIRD YEAR
ANA 407

THIRD YEAR
Fall ES 310, ES 342, ES 380, ES 341, NTR 301, CHE 203
Spring ES 343, ES 370, CHE 204, NTR 402, ES electives (ES 442 recommended)

FOURTH YEAR
Fall ES 340, ES 410, NTR 503, NTR 505, ES elective
Spring NTR 600, ES 496, 500/600 level electives, one of the following: MT 401, BCH 403, BIO 205

FIFTH YEAR
Fall PGY 551, NTR 500, NTR 630, STA 527, 500/600 level electives
Spring PGY 552, NTR 501, NTR 630, NTR 675 or 676, 500/600 level electives

Exercise Science And Epidemiology - B.S./M.P.H.

Acceptance Criteria

Students will apply to the BS/MPH program at the time of application to the upper division in Exercise Science. The student MUST submit the Promotion to Professional Sequence online application by the last academic day in January and indicate their intent to enter the BS/MPH program. The GRE score is required at the time of application. The student must have a minimum undergraduate GPA of 3.0 and grades of C or better in all ES prerequisite courses except for the following courses in which a B grade must be achieved: PGY 300 Physiology, MTH 121 Calculus and STA 119 Statistics. Graduates will receive a BS in Exercise Science and MPH in Epidemiology.

Prerequisite Courses

ANA 113 OR ES 113 Human Anatomy; OR APY 345 Comparative Primate Anatomy and APY 346 Dissections in Comparative Primate Anatomy
CHE 101 General Chemistry
CHE 102 General Chemistry
ES 200 Science of Human Movement
MTH 121 Survey of Calculus and Its Applications I or MTH 141 College Calculus I
NTR 108 Human Nutrition
PGY 300 Human Physiology
PHY 101 College Physics I
PHY 151 College Physics I Lab
PHY 102 College Physics II
PHY 152 College Physics II Lab
PSY 101 Introductory Psychology
STA 119 Statistical Methods

Required Courses

ANA 407 Gross Human Anatomy
ES 300 Athletic Injury
ES 310 Exercise Assessment and Prescription
ES 330 Lifespan Physiology OR NTR 402 Lifecycle Nutrition
ES 340 Physical Activity for Special Cases
ES 341 Critical Analysis of Scientific Literature
ES 342 Neuroscience I
ES 343 Neuroscience II
ES 370 Biomechanics
ES 380 Exercise Physiology
ES 402 Exercise Nutrition
ES 410 Exercise Assessment & Prescription II
ES 442 Applications in Exercise Science
ES 496 Practicum
SPM 501 Principles of Epidemiology

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SPM 502 Advanced Methods
SPM 506 Application of Statistics to Epidemiology
SPM 507/MGH 631/LAW 718 Introduction to Health Care Organization
SPM 533 Principles of Public Health
SPM 544 MPH Field Training
SPM 549 Environmental Health
SPM 590 Departmental Seminar
SPM 630 Integrative Project
STA 506 Intro Statistical Computing
STA 527 Introduction Medical Statistics

Electives
3 credits of ES electives
9 credits of epidemiology electives

Summary
Total required credit hours for undergraduate portion...92
Total required credit hours for BS/MPH...139

See Baccalaureate Degree Requirements for general education and remaining university requirements

Refer to the Graduate School's Policies and Procedures Manual for requirements for master's degree candidates.

Recommended Sequence of Program Requirements

FIRST YEAR
Fall CHE 101; MTH 121 or MTH 141; PSY 101
Spring CHE 102; STA 119; NTR 108

SECOND YEAR
Fall ANA 113*, PHY 101/PHY 151
Spring PGY 300, PHY 102/PHY 152, ES 200

*Anatomy requirement can also be satisfied by taking APY 345/APY 346 in the spring of the sophomore year.

SUMMER BEFORE THIRD YEAR
ANA 407

THIRD YEAR
Fall ES 310, ES 342, ES 380, ES 341, ES 300
Spring ES 343, ES 370, ES 442, ES 330 or NTR 402, ES elective

FOURTH YEAR
Fall ES 340, ES 410, ES 402, SPM 501, STA 527
Spring ES 496, SPM 502, STA 506, SPM 533
Summer SPM 544 MPH Field Training

FIFTH YEAR
Fall SPM 507, SPM 527, SPM 630, SPM 590, epidemiology elective
Spring SPM 549, SPM 506, SPM 590, 2 epidemiology electives

ES 102: Fundamentals of Wellness

Credits: 3
Semester(s): Fall, Spring
Type: LEC

The purpose of this class is to provide undergraduate students with information, theories, and practices, which support individual wellness and health promotion in the college community. The class utilizes an interactive learning environment that addresses key wellness issues, including: building healthy relationships, suicide prevention, nutrition and physical activity, alcohol and other drug use, sexual health, violence and sexual assault prevention, and media literacy.

ES 200: Science of Human Movement

Credits: 3
Semester(s): Spring
Type: LEC

Introduces the biological and physical bases of exercise responses and adaptations to chronic physical activity in humans. Emphasizes

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the integrated exercise responses of the body systems. Examination of appropriate exercise principles and concepts is accompanied by critical examination of misconceptions, fads, and myths that pervade exercise and fitness activities. Not recommended for students in their freshman year.

ES 300: Theory of Athletic Injury I

Credits: 3
Semester(s): Fall
Pre-requisites: ANA 407
Type: LEC

Studies the theory and principles of athletic injury as associated with human performance. Emphasizes the application of scientific principles of human growth and development, physical conditioning, injury prevention, and emergency care, and the understanding of rehabilitative procedures.

ES 310: Exercise Assessment, Prescription, and Programming I

Credits: 2
Semester(s): Fall
Pre-requisites: ANA 407
Co-requisites: Students must enroll in ES 310LBR and ES 310LEC in the same term.
Type: LAB/REC

Examines theoretical and practical aspects of exercise testing, body composition, fitness evaluation, client interviews and education, exercise prescription, emergency procedures, program administration, and management.

ES 330: Lifespan Physiology

Credits: 3
Semester(s): Spring
Pre-requisites: ANA 407
Type: LEC

Focuses on motor development, neural control of movement, learning, and memory throughout the life span, with special reference to pediatrics and geriatrics.

ES 340: Physical Activity for Special Cases

Credits: 3
Semester(s): Fall
Pre-requisites: ANA 407
Type: LEC

Analyzes exercise responses, testing and prescription, and adaptation to chronic physical activity in special populations, including cardiac and pulmonary rehabilitation, work hardening, chronic obstructive pulmonary disease, diabetes, pregnancy, and others.

ES 341: Critical Analysis of Scientific Literature

Credits: 2
Semester(s): Fall
Pre-requisites: STA 119
Type: LEC/DIS

Introduces the principles of critical analysis of scientific literature. Students will learn to access, interpret, and analyze research and review articles and information in oral presentations pertinent to their respective fields.

ES 342: Neuroscience I

Credits: 3
Semester(s): Fall
Pre-requisites: ANA 407
Type: LEC

Covers fundamental neurophysiology and clinical neuroanatomy of sensory systems.

ES 343: Neuroscience II

Credits: 3
Semester(s): Spring
Pre-requisites: ANA 407 Or ES 342
Type: LEC

A continuation of Neuroscience I, focusing on clinical neuroanatomy of motor systems and integration of sensory, motor, and cognitive functions.

ES 344: Neuroanatomy I

Credits: 1
Semester(s): Fall
Pre-requisites: ANA 407
Type: LEC

Available only to students in the Pre-PT track.

Exposes the student to the anatomical structures associated with neurophysiological concepts discussed in ES 342 and ES 343.

ES 345: Neuroanatomy II

Credits: 1
Semester(s): Spring
Pre-requisites: ANA 407
Type: LEC

Available only to students in the Pre-PT track.

Exposes the student to the anatomical structures associated with neurophysiological concepts discussed in ES 342 and ES 343.

ES 370: Biomechanics I

Credits: 4
Semester(s): Spring
Pre-requisites: ANA 407
Type: LEC/LAB

Introduces the mechanical, neuromuscular, and anatomical bases of human movement. Analyzes quantitative and qualitative biomechanical analyses of multisegment motion from the perspective of joint and muscle mechanics, kinematics, and kinetics.

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ES 380: Exercise Physiology

Credits: 3
Semester(s): Fall
Pre-requisites: ANA 407
Type: LEC

Analyzes physiologic responses and adaptations of the various body systems and structures to acute and chronic physical activity and to environmental stress. Emphasizes cellular mechanisms that underlie these responses.

ES 402: Exercise Nutrition

Credits: 2
Semester(s): Fall
Pre-requisites: ANA 407
Type: LEC

Examines nutrition for athletes, energy systems for different activities, weight control, ergogenic aids, osteoporosis, and selected health problems among athletes related to nutritional deficiencies.

ES 410: Exercise Assessment, Prescription, and Programming II

Credits: 1
Semester(s): Fall
Pre-requisites: ANA 407
Co-Requiste
Co-requisites: Students must register for ES 410 LEC and ES 410 LAB in the same term.
Type: LAB

Examines theoretical and practical aspects of exercise testing, body composition, fitness evaluation, client interviews and education, exercise prescription, emergency procedures, program administration, and management.

ES 428: Health Promotion, Prevention & Wellness

Credits: 3
Semester(s): Fall
Type: LEC

Examines health promotion from a public health perspective, a community and corporate perspective, and in terms of individual behavior change.

ES 429: Internship

Credits: 1-12
Semester(s): Fall, Spring, Summer
Pre-requisites: ANA 407 Or ES 410
Type: LAB

Conducted in settings conducive to the development/refinement of skills and abilities related to a professional role, under the guidance of an approved field supervisor and/or university personnel.

ES 442: Applications in Exercise Science

Credits: 1
Semester(s): Spring
Pre-requisites: ANA 407 Or ES 310
Type: LAB

Develops basic competencies necessary for the evaluation and assessment of needs, interests, and performance in comprehensive health-related fitness programming in compliance with American College of Sports Medicine guidelines. Provides skills training in the administration and interpretation of standard testing/assessment protocols in both on and off-campus laboratory settings.

ES 450: Professional Development

Credits: 1
Semester(s): Fall
Pre-requisites: ANA 407
Type: LEC

Facilitates transition from student to intern to entry level professional. Addresses securing an internship, professional development, and searching for employment.

ES 468: Epidemiology and Public Health for Health Professionals

Credits: 3
Semester(s): Fall, Spring, Summer
Type: LEC

ES 496: Practicum

Credits: 1-3
Semester(s): Fall, Spring, Summer
Type: LAB

The content of this course is variable and therefore it is repeatable for credit. The University Grade Repeat Policy does not apply.

Provides an opportunity for the student to gain some practical experience in a field setting. Sites are selected based on the student's career expectations. Arrangements must be made in conjunction with the clinical advisors on faculty.

ES 499: Independent Study

Credits: 1-4
Semester(s): Fall, Spring, Summer
Type: TUT

The content of this course is variable and therefore it is repeatable for credit. The University Grade Repeat Policy does not apply.

Offers the student a unique educational experience not covered by existing formal courses. This may include library research, laboratory projects, learning new techniques, or participating in ongoing projects.