Bachelor of Science

Exercise Science (BS)

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The Bachelor of Science degree in Exercise Science is designed to prepare students for careers in developing exercise and wellness programs in settings such as hospitals, wellness and rehabilitation centers, sports medicine clinics, sports performance centers, collegiate sport facilities, government agencies, health and fitness centers, and corporations. Academic preparation focuses on the scientific aspects of exercise related to a variety of populations, including athletes, first responders, and individuals with chronic conditions such as cardiovascular, pulmonary and/or metabolic disease. The curriculum follows the standards of American College of Sports Medicine (ACSM) and is an accredited Exercise Science Program by The Committee on Accreditation for the Exercise Sciences (COAES) under The Commission on Accreditation of Allied Health Education Programs (CAAHEP) (https://www.caahep.org/). Upon completion of this program students are able to and commonly obtain the following certifications:

- ACSM Exercise Physiology (ACSM EP-C)
- ACSM Clinical Exercise Physiology (ACSM CEP) (*with additional clinical hours)
- National Strength and Conditioning Association's (NSCA) Certified Strength and Conditioning Coach (CSCS)

The program also contains pre-requisite coursework and serves to prepare students for graduate studies in exercise science, physical therapy, athletic training, occupational therapy and other allied health fields including ODU's Exercise Science master's degree (https://www.odu.edu/academics/programs/masters/exercise-science/).

Major Declaration

To officially declare a major in Exercise Science, students must complete EXSC 225 and the following courses with a C or better : ENGL 110C, MATH 102M or MATH 103M, BIOL 121N, BIOL 122N, CHEM 121N, CHEM 122N, and BIOL 240 or BIOL 250.

Students who have met all major declaration requirements will be referred by their advisor in the Virginia Health Sciences Advising Center to the program director for major declaration and assignment to a program advisor. For additional information on the curriculum or major declaration requirements, please contact: Program Director (jkdavis@odu.edu) or the Virginia Health Sciences Advising Center (vhsadvising@odu.edu).

Advanced Placement

Departmental examinations for advanced placement are available for selected courses in the undergraduate programs. Please contact the department chair for further details. Refer also to the Policy on Prior Learning Assessment Credit Options at the Undergraduate Level in this Catalog.

Requirements

Lower-Division General Education

Written Communication (https://catalog.odu.edu/undergraduate/requirements-undergraduate-degrees/#written)	6
Oral Communication (https://catalog.odu.edu/undergraduate/requirements-undergraduate-degrees/#oral)	3
Mathematics (https://catalog.odu.edu/undergraduate/requirements-undergraduate-degrees/#math)	3
Language and Culture (https://catalog.odu.edu/undergraduate/requirements-undergraduate-degrees/#language)	0-6
Information Literacy and Research (https://catalog.odu.edu/undergraduate/requirements-undergraduate-degrees/#information)	3
Human Behavior (https://catalog.odu.edu/undergraduate/requirements-undergraduate-degrees/#behavior)	3
Human Creativity (https://catalog.odu.edu/undergraduate/requirements-undergraduate-degrees/#creativity)	3
Interpreting the Past (https://catalog.odu.edu/undergraduate/requirements-undergraduate-degrees/#interpret)	3
Literature (https://catalog.odu.edu/undergraduate/requirements-undergraduate-degrees/#literature)	3
Philosophy and Ethics (https://catalog.odu.edu/undergraduate/requirements-undergraduate-degrees/#philosophy)	3
The Nature of Science (https://catalog.odu.edu/undergraduate/requirements-undergraduate-degrees/#nature)	8
Impact of Technology (https://catalog.odu.edu/undergraduate/requirements-undergraduate-degrees/#impact)	3

Written Communication Skills: Grade of C or better required in both courses

Mathematical Skills: MATH 102M or MATH 103M or MATH 162M; grade of C or better required

Nature of Science: BIOL 121N/BIOL 122N and CHEM 121N/CHEM 122N

Information Literacy and Research: HLTH 120G preferred

Human Behavior: PSYC 201S preferred

Philosophy and Ethics: PHIL 345E preferred

Impact of Technology: Satisfied with EXSC 417 in the major

Upper-Division General Education

- Option A. Disciplinary Minor (a minimum of 12 hours determined by the department or Second Major or Second Degree
- Option B. Interdisciplinary Minor (specifically 12 hours, 3 of which may be in the major)
- Option C. An approved Certification Program such as teaching licensure
- Option D. Two Upper-Division Courses from outside the College of Health Sciences and not required by the major (6 hours)

Requirements for Graduation

Requirements for graduation include the following:

- Minimum of 120 credit hours.
- Minimum of 30 credit hours overall and 12 credit hours of upper-level courses in the major program from Old Dominion University.
- Minimum overall cumulative grade point average of C (2.00) in all courses taken.
- Minimum overall cumulative grade point average of C (2.00) in all courses taken toward the major.
- Minimum overall cumulative grade point average of C (2.00) in all courses taken toward a minor.
- Completion of ENGL 110C, ENGL 211C or ENGL 231C, and the writing intensive (W) course in the major with a grade of C or better. The W course must be taken at Old Dominion University.
- Completion of Senior Assessment.

Exercise Science Major

General Education		
Complete lower-division requirements		30-36
Complete upper-division requirements (minimum of 6 credit hours)		6
Exercise Science		
BIOL 240	Fundamentals of Anatomy and Physiology I	4
or BIOL 250	Human Anatomy and Physiology I	
BIOL 241	Fundamentals of Anatomy and Physiology II	4

or BIOL 251	Human Anatomy and Physiology II	
BIOL 121N & BIOL 122N	General Biology I and General Biology I Lab	4
CHEM 121N & CHEM 122N	Foundations of Chemistry I Lecture and Foundations of Chemistry I Laboratory (C or better required as prerequisite for CHEM 123N-CHEM 124N)	4
EXSC 225	Introduction to Exercise Science	3
EXSC 250	Strength and Conditioning Leadership	3
EXSC 310	Gross Anatomy for Exercise Science	3
EXSC 322	Anatomical Kinesiology and Musculoskeletal Injuries	3
EXSC 326	Exercise Physiology I	3
EXSC 327	Exercise Physiology II	3
EXSC 366	Exercise Science Seminar	1
EXSC 408	Nutrition for Fitness and Sport	3
EXSC 415	Exercise Testing for Normal and Special Populations	4
EXSC 417	Biomechanics	4
EXSC 428	Exercise Prescription for Chronic Disease	3
EXSC 431W	Wellness Programming and Administration *	3
PHYS 111N	Introductory General Physics	4
Options		
Select one of the following:		12-18
Clinical and Research Preparation		
Exercise and Sport Specialist		
Total Credit Hours		**104-116**

* Grade of C or better required

Options

Clinical and Research Preparation

BIOL 123N & BIOL 124N	General Biology II and General Biology II Lab	4
PHYS 112N	Introductory General Physics	4
CHEM 123N & CHEM 124N	Foundations of Chemistry II Lecture and Foundations of Chemistry II Laboratory	4
STAT 130M	Elementary Statistics	3
EXSC 420	Research Methods in Exercise Science (STAT 130M required as prerequisite)	3
Total Credit Hours		**18**

Exercise and Sport Specialist

EXSC 368	Internship (*)	12
Total Credit Hours		**12**

* In order to be eligible to register for EXSC 368, a student must have completed all EXSC courses with a GPA of 2.0 overall and in the major.

All EXSC courses will be used to calculate the major grade point average, which must be 2.00 to graduate.

Electives

Elective credit may be needed to meet the minimum of 120 credits required for the degree. Elective options may be dependent on whether or not the student needs to complete the Lower Division Language and Culture requirement. Please see your advisor for guidance on elective choices.

Degree Program Guide

The Degree Program Guide is a suggested curriculum to complete this degree program in four years. It is just one of several plans that will work and is presented only as broad guidance to students. Each student is strongly encouraged to develop a customized plan in consultation with their academic advisor. Additional information can also be found in Degree Works.

Exercise Science - Exercise and Sport Specialist Option

Course	Title	Credit Hours
Freshman		
Fall		
ENGL 110C	English Composition (C or better required)	3
MATH 102M or MATH 103M or MATH 162M	College Algebra (C or better required) or College Algebra with Supplemental Instruction or Precalculus I	3
BIOL 121N	General Biology I	3
BIOL 122N	General Biology I Lab	1
Oral Communication		3
Elective		1
	Credit Hours	**14**
Spring		
EXSC 225	Introduction to Exercise Science	3
CHEM 121N	Foundations of Chemistry I Lecture	3
CHEM 122N	Foundations of Chemistry I Laboratory	1
Information Literacy and Research (HLTH 120G preferred)		3
Interpreting the Past (https://catalog.odu.edu/undergraduate/requirements-undergraduate-degrees/#interpret)		3
Human Behavior (https://catalog.odu.edu/undergraduate/requirements-undergraduate-degrees/#behavior) (PSYC 201S preferred)		3
	Credit Hours	**16**
Sophomore		
Fall		
BIOL 240 or BIOL 250	Fundamentals of Anatomy and Physiology I or Human Anatomy and Physiology I	4
ENGL 211C or ENGL 231C	Writing, Rhetoric, and Research (C or better required) or Writing, Rhetoric, and Research: Special Topics	3
Minor or Elective or Foreign Language (if required)		3
Minor or Upper-Division General Education		3
Philosophy and Ethics (https://catalog.odu.edu/undergraduate/requirements-undergraduate-degrees/#philosophy) (PHIL 345E preferred)		3
	Credit Hours	**16**
Spring		
BIOL 241 or BIOL 251	Fundamentals of Anatomy and Physiology II or Human Anatomy and Physiology II	4
EXSC 250	Strength and Conditioning Leadership	3

Literature (https://catalog.odu.edu/undergraduate/requirements-undergraduate-degrees/#literature)		3
Human Creativity (https://catalog.odu.edu/undergraduate/requirements-undergraduate-degrees/#creativity)		3
Minor or Elective or Foreign Language (if required)		3
	Credit Hours	**16**
Junior		
Fall		
EXSC 322	Anatomical Kinesiology and Musculoskeletal Injuries	3
EXSC 326	Exercise Physiology I	3
EXSC 310	Gross Anatomy for Exercise Science	3
Minor or Upper-Division General Education		3
Elective		3
	Credit Hours	**15**
Spring		
PHYS 111N	Introductory General Physics	4
EXSC 327	Exercise Physiology II	3
EXSC 415	Exercise Testing for Normal and Special Populations	4
EXSC 366	Exercise Science Seminar	1
Elective		3
	Credit Hours	**15**
Senior		
Fall		
EXSC 428	Exercise Prescription for Chronic Disease	3
EXSC 431W	Wellness Programming and Administration (C or better required)	3
EXSC 417	Biomechanics	4
EXSC 408	Nutrition for Fitness and Sport	3
Elective		3
	Credit Hours	**16**
Spring		
EXSC 368	Internship	12
	Credit Hours	**12**
	Total Credit Hours	**120**

Exercise Science - Clinical and Research Preparation Option

Course	Title	Credit Hours
Freshman		
Fall		
ENGL 110C	English Composition (C or better required)	3
MATH 102M or MATH 103M or MATH 162M	College Algebra (C or better required) or College Algebra with Supplemental Instruction or Precalculus I	3
BIOL 121N	General Biology I	3
BIOL 122N	General Biology I Lab	1
Oral Communication		3
	Credit Hours	**13**
Spring		
EXSC 225	Introduction to Exercise Science	3
BIOL 123N	General Biology II	3
BIOL 124N	General Biology II Lab	1
Information Literacy and Research (HLTH 120G preferred)		3
Human Creativity (https://catalog.odu.edu/undergraduate/requirements-undergraduate-degrees/#creativity)		3
Human Behavior (https://catalog.odu.edu/undergraduate/requirements-undergraduate-degrees/#behavior) (PSYC 201S preferred)		3
	Credit Hours	**16**
Sophomore		
Fall		
BIOL 240 or BIOL 250	Fundamentals of Anatomy and Physiology I or Human Anatomy and Physiology I	4
ENGL 211C or ENGL 231C	Writing, Rhetoric, and Research (C or better required) or Writing, Rhetoric, and Research: Special Topics	3
STAT 130M	Elementary Statistics	3
Interpreting the Past (https://catalog.odu.edu/undergraduate/requirements-undergraduate-degrees/#interpret)		3
Minor or Elective or Foreign Language (if required)		3
	Credit Hours	**16**
Spring		
BIOL 241 or BIOL 251	Fundamentals of Anatomy and Physiology II or Human Anatomy and Physiology II	4
EXSC 250	Strength and Conditioning Leadership	3
EXSC 310	Gross Anatomy for Exercise Science	3
Literature (https://catalog.odu.edu/undergraduate/requirements-undergraduate-degrees/#literature)		3
Minor or Elective or Foreign Language (if required)		3
	Credit Hours	**16**
Junior		
Fall		
CHEM 121N	Foundations of Chemistry I Lecture	3
CHEM 122N	Foundations of Chemistry I Laboratory	1
EXSC 322	Anatomical Kinesiology and Musculoskeletal Injuries	3
EXSC 326	Exercise Physiology I	3
Minor or Upper-Division General Education		3
	Credit Hours	**13**
Spring		
CHEM 123N	Foundations of Chemistry II Lecture	3
CHEM 124N	Foundations of Chemistry II Laboratory	1
PHYS 111N	Introductory General Physics (*)	4

*Consider taking a summer science course Sophomore or Junior year to prevent multiple sciences in one semester.

EXSC 327	Exercise Physiology II	3
Philosophy and Ethics (PHIL 345E preferred)		3
Elective		1
	Credit Hours	**15**
Senior		
Fall		
PHYS 112N	Introductory General Physics	4
EXSC 415	Exercise Testing for Normal and Special Populations	4
EXSC 420	Research Methods in Exercise Science	3
EXSC 408	Nutrition for Fitness and Sport	3
EXSC 366	Exercise Science Seminar	1
	Credit Hours	**15**
Spring		
EXSC 417	Biomechanics	4
EXSC 431W	Wellness Programming and Administration (C or better required)	3
EXSC 428	Exercise Prescription for Chronic Disease	3
Minor or Upper-Division General Education		3
Electives		3
	Credit Hours	**16**
	Total Credit Hours	**120**

Courses

Exercise Science (EXSC)

EXSC 225 Introduction to Exercise Science (3 Credit Hours)
Broad overview of exercise science including the history of the discipline and introduction to the following: Healthy People 2010 goals and objectives related to physical activity and nutrition; basic principles of nutrition, body composition, applied physiology, functional anatomy, and exercise prescription/programming for healthy individuals and those who are high risk/diseased; career opportunities in various allied-health fields such as physical therapy, physician assistant, personal training, community/corporate/hospital-based wellness programs, cardiac rehabilitation; and research areas in exercise science.
Prerequisites: open only to students with Exercise Science as a concentration or major or minor

EXSC 240 Prevention and Care of Injuries Related to Physical Activity (3 Credit Hours)
Practice in the skills of injury recognition and evaluation and training in cardiopulmonary resuscitation. Principles and uses of therapeutic modalities are also discussed.
Prerequisites: BIOL 240 or BIOL 250 AND MATH 102M or higher with a C or better

EXSC 250 Strength and Conditioning Leadership (3 Credit Hours)
This course will provide the student with skills in exercise leadership. The student will learn how to lead resistance training, flexibility training, cardiovascular training involving a variety of exercise modes, and group exercise, such as step aerobics.
Prerequisites: BIOL 240 or BIOL 250 AND MATH 102M or higher with a C or better

EXSC 295 Special Topics in Exercise Science (1-3 Credit Hours)
The study of special topics in exercise science.
Prerequisites: Permission of the instructor

EXSC 309 Fundamentals of Exercise Physiology (3 Credit Hours)
This course is intended for non-exercise science majors. The course will investigate the metabolic adaptations, neuromuscular, endocrinological, cardiovascular and respiratory responses to acute and chronic exercise. Implications for health and physical performance will be integrated through applied exercise physiology. Specifically, the effects of different training modes, environmental factors, aging, disease states, nutrition, and ergogenic aids.
Prerequisites: BIOL 240 or BIOL 250

EXSC 310 Gross Anatomy for Exercise Science (3 Credit Hours)
This course offers an intensive, hands-on exploration of human gross anatomy with a focus on understanding anatomical structures, systems, and spatial relationships using prosected human cadavers. Emphasis is placed on muscle function, organ systems, anatomical variation, and the application of anatomical knowledge to clinical and movement scenarios.
Prerequisites: BIOL 240 or BIOL 250; MATH 102M or higher with a C or better

EXSC 322 Anatomical Kinesiology and Musculoskeletal Injuries (3 Credit Hours)
Anatomical and mechanical analysis of human musculoskeletal function and injury mechanisms. Analysis includes skeletal, muscular, and neuromuscular control aspects necessary for movement.
Prerequisites: BIOL 240 or BIOL 250 AND MATH 102M or higher with a C or better
Pre- or corequisite: EXSC 310

EXSC 326 Exercise Physiology I (3 Credit Hours)
An investigation into the metabolic adaptations, neuromuscular, endocrinological, and respiratory responses to acute and chronic exercise endeavors. Implications for enhanced health and physical performance are integrated.
Prerequisites: BIOL 240 or BIOL 250 with a C or better and MATH 102M or higher with a C or better
Pre- or corequisite: BIOL 241 or BIOL 251 with a C- or better and CHEM 121N and CHEM 122N with a C- or better

EXSC 327 Exercise Physiology II (3 Credit Hours)
Focuses on cardiovascular responses to exercise and applied exercise physiology, specifically the effects of different training modes, environmental factors, aging, disease states, nutrition, and ergogenic aids.
Prerequisites: BIOL 240 or BIOL 250 AND MATH 102M or higher with a C or better; EXSC 326

EXSC 366 Exercise Science Seminar (1 Credit Hour)
Seminar will include resume and cover letter writing skills, internship requirements, agency placement referrals, interviewing techniques, and certification options.
Prerequisites: BIOL 240 or BIOL 250 AND MATH 102M or higher with a C or better; EXSC 326

EXSC 368 Internship (12 Credit Hours)
Final field placement required for all students with an emphasis in exercise science. Students will be placed in an agency to gain experience in methodologies, administration techniques, and programs specific to their area of emphasis. Minimum of 400 clock hours. (qualifies as a CAP experience)
Prerequisites: senior standing, permission of the instructor, and completion of all required courses in appropriate emphasis areas

EXSC 369 Practicum in Exercise Science (3-6 Credit Hours)
Field-based experience in a fitness or allied-health setting. Minimum of 200 clock hours.
Prerequisites: EXSC 225

EXSC 397 Independent Study (1-3 Credit Hours)
Independent study of special topics under supervision of faculty.
Prerequisites: Junior standing and permission of the instructor

EXSC 403 Lifetime Fitness and Wellness (3 Credit Hours)
The focus of this course is on a positive healthy lifestyle designed to enhance the current and future quality of life. Topics include: proper exercise programs, healthful nutrition, stress management techniques, and avoidance of high-risk health behaviors in order to reduce disease risk and promote healthful aging. Various laboratory assessments are used to identify health status and recommend remedial approaches.
Prerequisites: Junior standing

EXSC 408/508 Nutrition for Fitness and Sport (3 Credit Hours)
Emphasizes the role of nutrition as a means to enhance health and performance in sport. Topics covered include energy metabolism and nutrients, regulation of metabolism by vitamins and minerals, and weight control.
Prerequisites: BIOL 240 or BIOL 250 with a C or better and MATH 102M or higher with a C or better
Pre- or corequisite: BIOL 241 or BIOL 251 with a C- or better and CHEM 121N and CHEM 122N with a C- or better

EXSC 415/515 Exercise Testing for Normal and Special Populations (4 Credit Hours)
The application of different methodologies in the measurement of physiologic responses to exercise. Emphasis is placed on understanding American College of Sports Medicine guidelines, appropriate experimental techniques, and equipment necessary to evaluate changes in body composition and various metabolic, cardiovascular, and respiratory adjustments during exercise.
Prerequisites: BIOL 240 or BIOL 250 AND MATH 102M or higher with a C or better; EXSC 326

EXSC 417/517 Biomechanics (4 Credit Hours)
Application of physical laws and mechanical principles to the human musculoskeletal system.
Prerequisites: BIOL 240 or BIOL 250 and MATH 102M or higher with a C or better; PHYS 111N with a C- or better; EXSC 322

EXSC 420/520 Research Methods in Exercise Science (3 Credit Hours)
Introduction to the scientific method applied to exercise science research including bioethics, review of the literature, research design, data collection, appropriate statistical analysis, research writing, and peer review.
Prerequisites: BIOL 240 or BIOL 250 and MATH 102M or higher with a C or better; STAT 130M

EXSC 421/521 Strength and Conditioning Applications (3 Credit Hours)
A study of the principles and techniques utilized in optimizing physical performance and reducing injury through proper and effective strength and conditioning programs. Special emphasis will be placed on current research findings, breakthrough techniques, advanced weight training techniques, and popular conditioning practices.
Prerequisites: EXSC 250 and EXSC 322

EXSC 428/528 Exercise Prescription for Chronic Disease (3 Credit Hours)
A study of pathophysiology of common diseases with concentration in the design, implementation and administration of exercise prescription for a variety of chronic diseases.
Prerequisites: BIOL 240 or BIOL 250 AND MATH 102M or higher with a C or better; EXSC 326

EXSC 431W/531 Wellness Programming and Administration (3 Credit Hours)
This course provides an introduction to the principles of administration and implementation of fitness and wellness programs to individuals, groups, centers, and corporate settings. This is a writing intensive course.
Prerequisites: BIOL 240 or BIOL 250, MATH 102M or MATH 103M or MATH 162M, and ENGL 211C or ENGL 221C or ENGL 231C with a C or better

EXSC 480/580 Exercise Psychology (3 Credit Hours)
Exercise Psychology examines the dynamic influences that psychological factors, environmental factors, and exercise behaviors exert upon one another. The field of exercise psychology actively promotes evidence-based interventions guided by theory and behavior change techniques. Utilization of the scientist-practitioner model involves the ability to consume and appropriately apply contemporary theory and scientific findings to the practice of applied exercise psychology. The content and assignments emphasize the theoretical and applied perspectives on the science and practice of exercise psychology.
Prerequisites: BIOL 240 or BIOL 250; and BIOL 241 or BIOL 251

EXSC 495 Special Topics In Exercise Science (1-3 Credit Hours)
The study of special topics in exercise science.
Prerequisites: Permission of the instructor

EXSC 498 Directed Research in Exercise Science (1-6 Credit Hours)
Supervised research on a specific problem in exercise science. Regular meetings with faculty and a written/oral report are required.
Prerequisites: Permission of the instructor