**FACULTY SENATE ISSUE FORM**

**Date Submitted:** March 1, 2018

**Title of Issue (a short descriptive title by which the issue may be referenced)**

Proposal for a Bachelor of Science in Exercise Science

**Description of Issue:** The College of Education seeks approval to offer a Bachelor of Science in Exercise Science, to begin fall 2019. This program will be offered by the Department of Human Movement Sciences.

**Rational for Submission:**

The purpose of the Bachelor of Science in Exercise Science is to prepare students for various entry-level jobs in the fitness industry, including personal trainers, strength coaches and corporate health promotion managers. Students may also secure entry-level positions in the healthcare field as exercise physiologists in cardiac rehabilitation or clinical exercise specialists. Lastly, a B.S. in Exercise Science is often considered a “stepping stone” degree toward the pursuit of a professional post-baccalaureate healthcare degree (e.g., physical therapy).

Graduates of the proposed Bachelor of Science in Exercise Science will be equipped with knowledge and skills to work independently or on a team to perform fitness assessments, provide exercise prescriptions, and perform basic health screenings such as blood pressure and body composition assessment. They will be equipped with knowledge to understand how and why exercise is effective in treating and preventing disease, and the ability to prescribe exercise as a treatment and preventative tool for chronic diseases and improving fitness.

A baccalaureate-level exercise science concentration has been offered within the physical education program at Old Dominion University since the early 1970s. However, the current classification under physical education is incongruous with the focus of exercise science. The existing concentration is not focused on pedagogy and does not prepare individuals to teach in school settings. The proposed program is aligned with the skills and knowledge required in the field of exercise science.

**Name:** Judy Bowman, submitted on behalf of Austin Agho
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<th>Department: Academic Affairs</th>
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For Faculty Senate Use Only

Assigned to Committee:

Date Assigned:
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<td>date approved by State Board for Community Colleges</td>
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<td>11. If collaborative or joint program, identify collaborating institution(s) and attach letter(s) of intent/support from corresponding chief academic officers(s)</td>
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<td>Department of Human Movement Sciences</td>
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<td>School(s) or college(s) of</td>
<td>Darden College of Education</td>
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<td>Campus(es) or off-campus site(s)</td>
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<td>13. Name, title, telephone number, and e-mail address of person(s) other than the institution’s chief academic officer who may be contacted by or may be expected to contact Council staff regarding this program proposal.</td>
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<tr>
<td>Jeanie Kline, Ed.D., SCHEV Liaison, 757.683.3261, <a href="mailto:jkline@odu.edu">jkline@odu.edu</a></td>
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Proposal for a Bachelor of Science in Exercise Science
Table of Contents

DESCRIPTION OF THE PROPOSED PROGRAM........................................... 1

PROGRAM BACKGROUND........................................................................... 1
MISSION........................................................................................................ 2
ADMISSIONS CRITERIA............................................................................... 2
TARGET POPULATION.................................................................................. 2
CURRICULUM............................................................................................... 3
STUDENT RETENTION AND CONTINUATION PLAN................................. 5
FACULTY........................................................................................................ 6
PROGRAM ADMINISTRATION................................................................. 6
STUDENT ASSESSMENT ........................................................................... 7
EMPLOYMENT SKILLS/WORKPLACE COMPETENCIES............................ 9
PROGRAM ASSESSMENT........................................................................... 9
BENCHMARKS OF SUCCESS..................................................................... 10
EXPANSION OF EXISTING PROGRAMS................................................. 11
RELATIONSHIP TO EXISTING ODU PROGRAMS....................................... 11
COMPROMISING EXISTING PROGRAMS................................................. 11
COLLABORATION OR STANDALONE PROGRAM..................................... 11

JUSTIFICATION FOR THE PROPOSED PROGRAM...................................... 11

RESPONSE TO CURRENT NEEDS............................................................ 19
EMPLOYMENT DEMAND.......................................................................... 23
STUDENT DEMAND.................................................................................. 25
DUPlication................................................................................................. 27
SUMMARY OF PROJECTED ENROLLMENTS............................................. 29

PROJECTED RESOURCE NEEDS ............................................................... 30

APPENDICES............................................................................................. 37

APPENDIX A—SAMPLE PLANS OF STUDY
APPENDIX B—COURSE DESCRIPTIONS
APPENDIX C—ABBREVIATED CVs FOR FACULTY
APPENDIX D—EMPLOYMENT DEMAND—LETTERS OF SUPPORT
APPENDIX E—EMPLOYMENT DEMAND—JOB POSTINGS
Description of the Proposed Program

Program Background

Old Dominion University (ODU) seeks approval to offer a Bachelor of Science in Exercise Science, to begin fall 2019 in Norfolk, Virginia. This program will be offered by the Department of Human Movement Sciences in the Darden College of Education.

The purpose of the Bachelor of Science in Exercise Science is to prepare students for various entry-level jobs in the fitness industry, including personal trainers, strength coaches and corporate health promotion managers. Students may also secure entry-level positions in the healthcare field as exercise physiologists in cardiac rehabilitation or clinical exercise specialists. Lastly, a BS in Exercise Science is often considered a “stepping stone” degree toward the pursuit of a professional post-baccalaureate healthcare degree (e.g., physical therapy).¹

Graduates of the proposed Bachelor of Science in Exercise Science will be equipped with knowledge and skills to work independently or on a team to perform fitness assessments, provide exercise prescriptions, and perform basic health screenings such as blood pressure and body composition assessment. They will be equipped with knowledge to understand how and why exercise is effective in treating and preventing disease, and the ability to prescribe exercise as a treatment and preventative tool for chronic diseases and improving fitness.

The background of this field includes the founding of the American College of Sports Medicine (ACSM) in 1954 by a small group of physicians, scientists, and physical educators. The organization has grown to become the largest professional body of exercise scientists in the world. Because the ACSM’s initial focus was on the physiology, training, and medical care of athletes, some overlapping terminology has developed in the field. The ACSM no longer has “sports medicine” as its primary focus, but the term remains in the name for historical purposes. The best term for the field of study that encompasses the scientific study of how the body responds to exercise is “exercise science.” A related term is “kinesiology,” which technically means “study of movement.” It is sometimes used synonymously with exercise science, but kinesiology also has a more narrow focus in describing which muscles are involved in what movements. More broadly, exercise science incorporates the study of the physiological responses within the body to acute or chronic exercise (exercise physiology) and the study of the forces involved in movement utilizing the laws of physics (biomechanics).

A baccalaureate-level exercise science concentration has been offered within the physical education program at Old Dominion University since the early 1970s. However, the current classification under physical education is incongruous with the focus of exercise science. The existing concentration is not focused on pedagogy and does not prepare individuals to teach in school settings. The proposed program is aligned with the skills and knowledge required in the field of exercise science.

¹ See http://www.exercise-science-guide.com/blog/what-can-you-do-with-exercise-science-degree/#Bachelor8217s_Degree
Mission

The mission of the institution says: “Old Dominion University, located in the City of Norfolk in the metropolitan Hampton Roads region of coastal Virginia, is a dynamic public research institution that serves its students and enriches the Commonwealth of Virginia, the nation and the world through rigorous academic programs, strategic partnerships, and active civic engagement.”

The Bachelor of Science in Exercise Science will align with this mission by providing a rigorous academic program that prepares graduates for careers in health-related fields. Such work utilizes exercise as preventive or rehabilitative medicine (e.g., corporate health promotion, strength and conditioning, cardiac rehabilitation). The proposed program also gives students the foundation required for graduate programs in exercise science, physical therapy and occupational therapy.

Further, both faculty and students in the existing exercise science concentration are engaged in the community and maintain strategic partnerships with organizations outside of ODU. Faculty and students in the proposed program will continue such engagement in offering biometric screening, volunteering in the department’s wellness institute, and offering exercise prescriptions and programming for various populations in the community.

Admissions Criteria

The requirements for a Bachelor of Science in Exercise Science include:

- A completed online application and application fee
- A high school diploma or GED for traditional freshman students
- Official copies of transcripts from all regionally-accredited post-secondary institutions attended, with a GPA of 2.5 or better, for those who have attended previous institutions
- A Test of English as a Foreign Language (TOEFL) score of 550 on the paper-based test (or 79-80 on the iBT) for non-native English speakers

Optional documentation for prospective students who choose to submit such materials may include reference letters, a personal essay or other materials selected by the applicant.

Target Population

The primary candidates for this program are high school graduates or transfer students with an interest in entry levels careers related to fitness and health promotion, particularly when specific positions require a baccalaureate degree. Other individuals to be targeted include those who wish to work in clinical settings where exercise is a key component of improving the health of populations with chronic or other types of diseases.
Curriculum

The proposed Bachelor of Science in Exercise Science is a 120-hour program. Students are required to complete lower- and upper-division general education requirements, 34 credits in the exercise science professional core, 20 credits in the science core, and 12-18 credits in the selected career option.

The professional core addresses a variety of aspects related to exercise and its connection to disease, fitness, wellness, and health. Courses focus on areas such as nutrition, kinesiology, exercise physiology, strength and conditioning, chronic disease, wellness, and exercise diagnoses and prescriptions. The science core includes courses in anatomy and physiology as well as chemistry.

The selected career options available are:

1. Prevention and rehabilitation with an internship experience, intended to provide students with hands-on practice in a clinical, corporate, or research setting related to exercise science
2. Scientific foundations, aimed at preparing students for a graduate program in a health profession. Students will consult with an exercise science faculty member for appropriate courses in this latter option.

The required 120-hour curriculum consists of existing courses at Old Dominion University, as shown below:

**Lower Division General Education (38-44 credit hours)**

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<tr>
<th>Course</th>
<th>Credits</th>
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<td>Written Communication Skills</td>
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<td>Oral Communication</td>
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<td>Mathematical Skills</td>
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<tr>
<td>Language and Culture</td>
<td>0-6*</td>
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<td>Information Literacy and Research</td>
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<td>Human Creativity</td>
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<td>Interpreting the Past</td>
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<td>Literature</td>
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<td>Philosophy and Ethics</td>
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<tr>
<td>The Nature of Science: BIOL 121N/122N and BIOL 123N/124N</td>
<td>8</td>
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<td>Human Behavior: PSYC 201S</td>
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<td>Impact of Technology</td>
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<td>Satisfied in the major (EXSC 417W)</td>
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*Students who earned a high school diploma before December 31, 1985 and those whose native language is not English are exempt from this requirement. Others may meet the requirement if they have a transfer associate degree that satisfies all lower-level general education coursework or if they have successfully completed three years of one language or two years of two different languages in high school. If the requirement has been met, no course work is needed for this category. Otherwise, students must complete 6 credit hours of a foreign language.
Science Core (20 hours)
BIOL 240 or 250 Anatomy & Physiology I  4 credits
BIOL 241 or 251 Anatomy & Physiology II  4
CHEM 121N/122N Foundations of Chemistry I  4
CHEM 123N/124N Foundations of Chemistry II  4
PHYS 111N Introductory General Physics  4

Exercise Science Core (34 credit hours)
EXSC 225 Introduction to Exercise Science  3 credits
EXSC 240 Prevention and Care of Injuries Related to Physical Activity  3
EXSC 250 Strength and Conditioning Leadership  3
EXSC 322 Anatomical Kinesiology  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 417W Biomechanics  4
EXSC 428 Exercise Prescription and Chronic Disease  3
EXSC 431W Wellness Programming and Administration  3

Career Options, choose one (12-18 hours)
1. Prevention and Rehabilitation
   EXSC 368 Internship*  12 credits

   or

2. Scientific Foundations
   PHYS 112N  4 credits
   STAT 130M  3
   Approved Elective  3-4
   Approved Elective  3-4
   EXSC 420 Research Methods in Exercise Science  3

Upper Division General Education (6-30 credit hours)
Four options are available for students in the proposed program, as follows:

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
Six (6) hours of elective upper division courses from outside the student's major discipline and college.

Electives
If needed, students will work with their advisor to select elective coursework sufficient to reach the minimum requirement of 120 credit hours for the baccalaureate degree.

*Students who select the prevention and rehabilitation option are required to complete an internship. Experiential learning is a key component of the curriculum for students wishing to pursue a clinical career after graduation. The internship provides students with the opportunity to apply concepts learned in the classroom to real world experiences. This on-the-job training gives students opportunities to be competitive in the job market, with a portfolio of proficiencies gained through their program.

Requirements of the internship include the completion of 400 documented hours in an approved setting and completion of pre-determined goals and objectives. During the internship, students must follow the guidelines set forth in the internship manual and complete all required assignments. These assignments include: 1) an initial report detailing schedules, responsibilities, and goals; 2) weekly reports signed by the site supervisor and sent to the faculty supervisor; and 3) written reports on a collection of case studies or projects completed through their internships. In addition, the internship site supervisor provides both a mid-term and final evaluation on the student’s work. The internship is graded on a letter basis. If a student fails the internship, the student may complete another internship after consulting with the internship coordinator. Failure of the second internship results in termination from the program.

Sample plans of study are available in Appendix A.
Course descriptions are provided in Appendix B.

Student Retention and Continuation Plan

Student retention will be facilitated by requiring that all students entering the Bachelor of Science in Exercise Science meet with the undergraduate program coordinator (UPC), or a faculty advisor from exercise science, to discuss program requirements, advising, and continuance. Subsequently, if difficulties develop, faculty will direct students to various university resources (e.g., Student Success Center, Academic Enhancement, Counseling, Writing Center, tutors). Students must meet with faculty on a semester-by-semester basis for course registration and degree planning.

Advising/scheduling workshops are also held several times throughout each semester in order to provide students with information necessary to register for courses for the following term. Additionally, the undergraduate program coordinator will be available during regularly-
scheduled office hours to meet with individual students concerning scheduling, internships, career options, etc. The program coordinator may also schedule meetings with students who are underperforming in the program in order to formulate a plan of action for improvement.

During scheduling workshops and individual advising meetings, the program coordinator will reiterate the continuance requirements for the program, including an overall GPA of 2.0, demonstrated writing proficiencies, and completion of all exercise science core requirements. If a student is struggling, the advisor will work with the student to put a plan of action in place to improve academic performance, such as tutoring, a change of study habits, additional resources for a difficult topic, or referral to the Student Success Center.

Faculty

Existing faculty members in the Department of Human Movement Sciences have both depth and breadth of knowledge in exercise science to cover the full range of classes offered in the major. The exercise science faculty include one full professor, one associate professor, and three assistant professors, all of whom possess terminal degrees. One additional member of the faculty, a lecturer, holds a master’s degree. The tenure and tenure-track faculty members have established records as productive researchers with over 200 peer-reviewed publications among them.

One lecture line is currently vacant and will be filled in fall 2018. In addition, a new faculty line—a lecturer—has been approved for this program effective fall 2018. Both new lecturers are expected to have, at minimum, a graduate degree in exercise science.

Abbreviated CVs of the exercise science faculty can be found in Appendix C.

Program Administration

The program will be housed in the Department of Human Movement Sciences (HMS) within the Darden College of Education. A full-time faculty member from HMS will serve as undergraduate program coordinator (UPC), and will direct the coordination of the Bachelor of Science in Exercise Science, and prepare assessment and accreditation reports for the program. The UPC will also ensure program compliance with university policies and procedures.

An administrative assistant, housed in the Department of Human Movement Sciences, will support the program. This individual serves as Office Manager and Fiscal Tech for Human Movement Sciences. Approximately 20% of the incumbent’s time is devoted to serving the undergraduate exercise science program. She/he assists with scheduling classes, making arrangements for guest speakers, completing book orders, and other duties requested by faculty.

The full-time exercise science program faculty will continue their current practice of meeting monthly throughout the academic year and as needed during the summer months.
Student Assessment

Data related to the student learning outcomes will be collected on an annual basis to reflect Commission on Accreditation of Allied Health Education Programs (CAAHP) accreditation standards and reported on the university’s assessment database. Evidence of student achievement of learning objectives will be assessed during the program through practical and written exams, assignments, research projects and presentations. Each course will have objectives that need to be met in order for the student to successfully pass that course.

In order to assure that students are learning the major objectives of the program, faculty will assess student learning in several ways, including annual evaluation of all courses, tracking students’ academic progress each semester, reviewing faculty evaluations conducted by the student and through peer evaluation.

The student learning outcomes for the Bachelor of Science in Exercise Science include the following:

1. Demonstrate professional communication skills through written, oral, and technological methods that are important in exercise science
2. Propose, develop, implement, and analyze data from a research question to test hypotheses related to exercise programming effectiveness for diverse populations.
3. Perform exercise testing techniques to evaluate health/wellness and fitness in order to develop individualized exercise prescriptions.
4. Graduates of the program will be satisfied with the program and program faculty

Below is a map of these outcomes, as well as the method of assessment associated with each. Each student learning outcome (SLO) is addressed multiple times during the curriculum because acquiring the knowledge, skills and abilities for mastery of the objectives is a process rather than a one-time event. At completion of the curriculum each student will have had the opportunity to demonstrate mastery of each SLO.
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<th>Student Learning Outcomes</th>
<th>Courses &amp; Co-Curricular Activities that Develop Competency</th>
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<tr>
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<td>Course Number &amp; Title</td>
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<td>Assessment (rubric used for grading)</td>
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| 1. Demonstrate communication skills through written, oral, and technological methods relevant to clients and/or population’s needs. | Measures: **EXSC 368 Internship**  
Assessment: 75% of the students will be rated “above average” or better on the internship evaluation  
**EXSC 420 Research Methods**  
Assessment: 75% of the students will earn at least 80% on the research paper. |
| 2. Propose a research question, develop a plan to address the problem, apply appropriate research methods, interpret data collected, and draw conclusions relative to the research question. | Measures: **EXSC 420 Research Methods**  
Assessment: 75% of students will earn at least 80% on the research paper. |
| 3. Apply skills needed to assess physical fitness measurements such as heart rate, blood pressure, and body composition | Measures: **EXSC 415 Exercise Testing for Normal/Special Populations**  
Assessment: 75% of students will earn at least 80% on the physical fitness assessments and lab report.  
**EXSC 368- Internship**  
Assessment: 75% of the students will be rated "above average" or better on the internship evaluation. |
| 4. Graduates of the program will be satisfied with the program and program faculty | Measures: **Alumni Satisfaction Survey**  
Assessment: 75% of the students will be satisfied with the program and program faculty  
**Job Placement /Advanced Education**  
Assessment: 80% of graduates will enter graduate school or be employed.  
**Student Self-Study Evaluation Questionnaire**  
Assessment: 80% of the students will be satisfied or better with the program and faculty |
Workplace Competencies and Employment Skills

Specifically, graduates of the proposed program will have the ability to:

1. Critically appraise and conduct physical fitness training and testing in healthy and unhealthy populations.
2. Demonstrate an understanding of contraindications, risks, safety precautions, and end point of a stress test
3. Effectively communicate (written, oral, and technological) with clients/patients and team members to ensure that goals are being met.
4. Maximize the safety of each member/client by assisting fitness area/equipment instruction and proper exercise program development based on individual’s health and fitness condition.
5. Assist clients with exercise programming, health education, and utilize disease management techniques in order to help the client/patient achieve a healthier lifestyle.
6. Perform basic health/laboratory techniques for patient safety during exercise such as blood pressure monitoring, stress testing, body composition analysis.
7. Educate clients/athletes on areas such as heart rate monitoring, recovery techniques, hydration strategies, overtraining, and acclimatization to maximize performance.
8. Provide corrective coaching on poor ergonomic body postures and provide potential countermeasures to improve physical performance.

Upper-Level Curriculum Content Fulfilling Workplace Competencies:

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Program Assessment

The program will be assessed by the Department of Human Movement Sciences, the Darden College of Education, and the Office of Academic Affairs. The department review will be completed annually in the fall of each year, and will consist of:

- Analyzing data from the university’s assessment tool, WEAVE (Write-Establish-Assess-View-Effect) report;
- Analyzing retention and attrition rates in order to maximize the positive influences and ameliorate the negative ones that affect program completion.
• Analyzing the results of the Old Dominion University internship site evaluations to identify potential areas for improvement within the curriculum;
• Analyze the need for curriculum changes based on student, alumni, or accreditation feedback.

Results from these assessments will be used to evaluate the quality of the program, to stimulate program development, and to assess the role of the program in fulfilling ODU’s institutional mission. The program review may result in strategic decisions about the program, may identify areas of potential improvement, may make resource recommendations, may articulate considerations for expansion or consolidation, and may consider other aspects of programmatic quality with respect to policies and practices relative to:

• Student recruitment, admissions, advising, and retention;
• Enrollment projections including consideration of the context of the SCHEV 5-year benchmark and other on-going enrollment targets;
• Course descriptions and implementation;
• Curriculum changes and development;
• Faculty development and research activities;
• Facilities;
• Internal and external funding; and
• Description of strengths and weaknesses with attention to points of action for the future.

The results of this review will be incorporated into the college’s annual review. The dean and associate dean will read the program review each year to ensure that progress is being made. The college annual review of the program will be sent to the vice provost for review each year. The vice provost will ensure the provost is kept abreast of any items that need to be addressed in the process.

**Benchmarks of Success**

Benchmarks of success for this bachelor’s program will include enrollment goals and professional placement of graduates. Success will be determined by the way the program affects academic and career goals as well as the future job prospects and mobility of its students:

• 80% retention of students who enter the program;
• 25% of students will participate in the national credentialing exams following graduation (e.g. American College of Sports Medicine, American Council on Exercise, National Strength and Conditioning Association);
• 75% of the students will have earned jobs in exercise science and related fields or will be enrolled in graduate programs within 12 months of program completion;
• 85% of students will be satisfied with the program as determined by the university’s Student Satisfaction Survey;

Faculty and administrators will conduct a yearly evaluation of the success of the program in meeting these benchmarks. Methods of benchmark-related data collection will include surveys,
interviews, and employer feedback. If program benchmarks are not achieved, the program faculty will examine curriculum, instructional methods, internship placements, advising practices, and course and lab evaluations to determine where changes need to be made, or if benchmarks need to be updated. The plan of action will be submitted to the associate dean for approval, suggestions, and any allocation of resources necessary for success.

Expansion of an Existing Program

The Bachelor of Science in Exercise Science is an expansion of a current concentration with the Bachelor of Science in Physical Education. The concentration in exercise science has grown since its inception in the 1970s and this standalone degree addresses the field of exercise science rather than the physical education discipline. It also aligns with SCHEV core requirements for majors. Once the proposed program is approved, the concentration will be discontinued.

Relationship to Existing Degree Programs

The proposed Bachelor of Science in Exercise Science is not similar or related to any other baccalaureate degree program at Old Dominion University.

Compromising Existing Degree Programs

No degree programs will be compromised or closed as a result of the initiation and operation of the proposed degree program.

Collaboration or Standalone

This is a standalone program. No other organization was involved in its development, and no other organization will collaborate in its operation.

Justification for the Proposed Program

Response to Current Needs
(Specific Demand)

The field of exercise science has expanded for two key reasons: (1) there is a greater focus on unhealthy individuals and their need for exercise to help them regain their health, and (2) there is a growing interest among healthy people, including athletes, to maintain and improve their health.
Among the former, many Americans suffer from lifestyle diseases of obesity, type 2 diabetes, heart disease, osteoporosis and more, and exercise is a key factor that can be used to reduce these diseases. More than two-thirds of adult Americans are overweight (33%) or obese (36%). In Hampton Roads, Norfolk has an obesity rate of 35% and the rate in Portsmouth is 42%. Excess weight greatly increases the risk of type 2 diabetes and contributes to other chronic conditions such as coronary heart disease (which is the leading cause of death in the U.S.) and osteoporosis. Proper exercise can reduce obesity; it also has a direct effect in combatting diabetes (by increasing insulin sensitivity), heart disease (by multiple mechanisms), and osteoporosis (by stimulating bone mineral density). The proposed program is intended to equip individuals with knowledge and skills that will address many of these health concerns—through exercise.

In addition, professionals with backgrounds in exercise science can also work with healthy and elite athletes. Paul Davis, Associate Professor of Kinesiology at UNC Greensboro, noted, “The type of client that can benefit from training under an exercise physiology professional varies greatly, ranging from world class athletes wishing to improve their performance to patients with chronic illnesses wishing to increase or maintain their ability to accomplish activities of daily living.” As the number of individuals with chronic disease continues to grow, so will the demand for individuals with exercise science degrees. Demand continues to rise, also, for individuals working in fitness, wellness, and nutrition environments.

This demand for those with a BS in exercise science is growing with the rapid rise in the fitness industry. According to the International Health, Racquet, and Sportsclub Association (IHRSA) from 2009 to 2016 the number of individuals visiting health clubs increased 25% and globally, the health club industry revenue was $81 billion in 2016. Individuals with a BS in exercise science will be qualified to work with the clientele in the fitness industry:

If we believe that the need for physical activity in our country and the world is paramount because the benefits of a physically active lifestyle are great in terms of good health, then we must conclude that the more people involved in both physical activity and the promotion of physical activity, the better. Thus, the growth in the undergraduate major is a good thing and one that perhaps would not have been imagined a few decades ago.
In the exercise science field, the American College of Sports Medicine (ACSM) is a highly regarded organization and certifications from ACSM are considered to be the gold standard of the field. Thus, students wishing to pursue the exercise science field, need to have a bachelor’s degree in exercise science in order to obtain these certifications. Many jobs in the exercise science field call for employees to have additional certifications though ACSM, ACE, or NSCA to be eligible to for the position. The proposed BS in Exercise Science at Old Dominion University will be the first step in these students’ careers in obtaining certifications and ultimately jobs in the exercise science field. Further, the ACSM has recognized the importance of exercise as a component of health care and has outlined the “most urgent goals for advancing the profession.” These goals are focused on the education of exercise science professionals at the collegiate level.

The goals mentioned by the ACSM include the importance of articulating “the value of an academic degree in exercise science for those working with patients and clients with medical conditions that require minimal- to advanced-clinical support.” The value of the exercise science degree is such that “Exercise Science professionals holding an exercise-science based degree have specific knowledge that is not duplicated in other health-related professions. A degree exercise professional has the in-depth background and appropriate training for proper patient/client interventions.” And that “It is critically important to educate health care professionals, policymakers and the general public about the difference between a degreed exercise professional and a non-degreed exercise professional, and the value that degreed professionals bring to patient populations with medical conditions that require minimal to advanced clinical support.”

Further, the American Society of Exercise Physiologists (ASEP) lists as an organizational objective “to encourage the implementation of undergraduate and graduate education programs to meet the diverse interests and healthcare career opportunities in exercise physiology…” While exercise physiology is only one component of an exercise science degree, this statement by the ASEP reiterates a similar demand for programs in exercise science.

Keteyian (2004) recognized the need for “learned and trained exercise professionals who are able to assist both apparently healthy people and those with clinically manifest disease.” Exercise science programs meet “an exponentially increasing demand by the public for learned and trained exercise professionals who are able to assist both apparently healthy people and those with clinically manifest disease.”

“The enrollment patterns in a number of institutions confirm the heightened interest in kinesiology as an undergraduate major.” There has been an approximately 50% increase in enrollment in

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15 Need to add – have PDF save = ACSM Improves the Preparation of Exercise Professionals
kinesiology programs around the United States over a 5 year period compared to only a 6.5% increase in overall enrollments. Thus, a demonstrated need exists for kinesiology (exercise science) undergraduate programs to fulfill the needs of undergraduate students wanting to pursue this career. “A key factor in kinesiology’s unprecedented growth and increased popularity as an undergraduate degree choice has been its expanded scientific basis and its increased professional application opportunities.”

**Employment Demand**

There exists a growing demand for exercise science professionals in today’s job market. Most graduates of the proposed Bachelor of Science in Exercise Science are expected to seek employment in hospital or clinical (outpatient) settings (cardiac, pulmonary, oncology rehabilitation, physical or occupational therapy-with an additional degree) or corporate settings (fitness and wellness centers). Some graduates of the proposed program wishing to pursue higher education may also secure careers in academia, such as teaching and/or research with an additional master’s or doctorate degree in exercise science. Specific job titles for graduates of the program may include: Sports Performance Coach, Performance Specialist, Cardiac Exercise Specialist, Wellness Coach II, Exercise Physiologist I, Fitness Performance Coach, and Health Fitness Specialist I.

The Bureau of Labor Statistics provides a detailed breakdown in job outlook by occupation. For the period from 2016 through 2026, faster than average growth is expected in the occupation of exercise physiologists (13%) as well as fitness trainers and instructors (10%). These data provide evidence that the exercise science job market is strong, and thus, employment demands for individuals with college degrees in exercise science is high.

The Virginia Employment Commission provides details about demand for jobs related to exercise science within the Commonwealth. The table below shows the long term employment projections for exercise physiologists in Virginia for the 2014-2024 projection period.

<table>
<thead>
<tr>
<th></th>
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<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>924</td>
<td>1,083</td>
<td>159</td>
<td>1.60%</td>
<td>17.21%</td>
</tr>
</tbody>
</table>

19 https://www.bls.gov/ooh/healthcare/exercise-physiologists.htm
The VEC also provides data for fitness trainers and aerobics instructors in Virginia for the 2014-2024 projection period.  

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>10,359</td>
<td>11,898</td>
<td>1,539</td>
<td>1.39%</td>
<td>14.86%</td>
</tr>
</tbody>
</table>

Graduates of the existing Bachelor of Science in Physical Education with a concentration in exercise science have been successful in finding employment or getting into graduate degree programs since this concentration was introduced in the 1970s. Students from the program have gone on to work as exercise physiologists/specialists in cardiac rehabilitation programs, or they have entered graduate programs in physical therapy, athletic training, or exercise science.

Letters of support for the Bachelor of Science in Exercise Science are available in Appendix D. Job announcements are located in Appendix E.

**Student Demand**

The existing program, Bachelor of Science in Physical Education with a concentration in exercise science, has successfully enrolled over 100 students per year over the past seven years. Demand for this program continues to be high, as evidenced, in part, from the orientation staff at Old Dominion who noted that in the last three years, an average of 128 freshmen and transfer students per year have expressed interest in this concentration.

Based on these data, faculty have projected enrollment from the launch of the program in 2019 to the target year, 2023, as follows.

**Projected Enrollment:**

<table>
<thead>
<tr>
<th>Year 1</th>
<th>Year 2</th>
<th>Year 3</th>
<th>Year 4</th>
<th>Year 5</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td><strong>Target Year</strong></td>
<td><strong>Target Year</strong></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>(2-year institutions)</td>
<td>(4-year institutions)</td>
</tr>
<tr>
<td>HDCT 160</td>
<td>FTE 140</td>
<td>HDCT 160</td>
<td>FTE 140</td>
<td>HDCT 160</td>
</tr>
</tbody>
</table>

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Assumptions
Retention in the program: 80%
Percentage of full-time students: 80%
Percentage of part-time students: 20%
Full-time students credit hours per semester: 15
Part-time students credit hours per semester: 6-9
Full-time students graduate in 4 years
Part-time students graduate in 6-8 years

Duplication

There are six public institutions in Virginia that offer programs similar to the proposed Bachelor of Science in Exercise Science. Similarities and differences between each of these programs and the proposed program are described below.

George Mason University (GMU)
The program at GMU is a Bachelor of Science in Kinesiology.

Similarities
Both programs require two semesters of anatomy and physiology and exercise physiology. Further both programs require exercise testing and prescription courses, a biomechanics course, and a sports nutrition course.

Differences
For the core science courses, the ODU program requires chemistry and physics, and these are not required at GMU. Further, the GMU program requires an additional functional anatomy course that the ODU program does not include. While both programs have internship courses, GMU requires 18 internship credit hours and ODU offers a 12-credit internship track for students who select this option. The ODU program has 2 career track options 1) prevention and rehabilitation (internship option) or 2) scientific foundations (scientific foundations option) which the GMU program does not distinguish between different career options. Both programs require a psychology course, however, the course required at GMU is psychology of sport, while at the ODU this is a human behavior course. The approximate number of credits for the ODU program is 66, while number of credit hours is 71 for the GMU program. Finally, the GMU program does not contain a laboratory course within the program, while the proposed program at ODU requires two 4-credit laboratory classes.

James Madison University (JMU)
JMU offers a Bachelor of Science in Exercise Science.

Similarities
The approximate number of credits for the program is similar (ODU-66 credits and JMU-60-68 credits). Both programs require anatomy and physiology, along with chemistry, and both programs offer an exercise physiology course.
Differences
The ODU program has a strong science foundation by requiring biology and physics as core science courses in addition to anatomy and physiology and chemistry; biology and physics are not required at JMU. The ODU program requires an introduction to psychology course while the JMU program requires a physical activity-behaviors course. JMU offers a motor development course, while the ODU program does not. The biomechanics and kinesiology classes that the ODU program requires are combined into one class at JMU. The program at ODU requires a research methods course for the scientific foundations option, and the program at JMU does not offer such course. JMU requires that students complete an internship of 4-12 credit hours, while at ODU the internship is optional.

College of William and Mary (W&M)
The College of William and Mary offers a Bachelor of Science in Kinesiology and Health Sciences with an option of selecting one of the following concentrations: allied health, premed, and public health. Students may also complete the program without a concentration. While none of these concentrations is particularly similar to the proposed program at ODU, the allied health concentration has some similarities to the ODU program.

Similarities
An internship is offered for those who select the career track in the ODU program; it is also available to those who select the allied health concentration at W&M. Both programs have laboratory-based courses within the program. Both programs require a biomechanics course.

Differences
The ODU program requires a number of science courses (biology, anatomy and physiology, chemistry, and physics) while the W&M program requires human anatomy and physiology. The W&M program offers a 34-credit curriculum, while the ODU program is 66 credits. ODU’s laboratory-based courses are in both science and exercise science classes and W&M laboratory-based courses are part of anatomy and physiology classes. The ODU program requires 2 semesters of exercise physiology, chemistry, anatomy and physiology while the W&M program requires 1 semester. The W&M program does not require psychology, exercise testing and prescription, or physics while the program at ODU does require these courses. The ODU program does not require statistics, public health, microbes in human disease, physiology of aging, neuromuscular physiology or medical terminology courses while the W&M program does require these courses.

Norfolk State University (NSU)
NSU offers a Bachelor of Science in Kinesiotherapy.

Similarities
NSU and ODU programs offer an internship and/or clinical experience practicum as part of the curriculum. Further, both programs have a rigorous science core requirement of biology, chemistry, physics, anatomy and physiology, and psychology. Both programs also offer lab courses within the program.
Differences
The NSU program does not offer an exercise testing and prescription class. Further, the biomechanics course at NSU does not have a lab, whereas the ODU biomechanics course does. The NSU program requires a research methods course as part of its curriculum, while at ODU this is required if the student is in the scientific foundations track. ODU does not offer a neurological and pathological foundations in exercise science course. Lastly, the NSU program requires 1 exercise physiology course while the ODU program requires 2 exercise physiology courses in the curriculum.

University of Virginia (UVA)
UVA offers a Bachelor of Science in Education—Kinesiology.

Similarities
UVA requires a practicum that is similar to the internship that ODU offers to students who select the career track.

Differences
The core science classes are different between the two programs with UVA requiring biology, anatomy and physiology, and calculus. ODU requires biology, anatomy and physiology, chemistry and physics as core science classes. Biomechanics and kinesiology are combined into one course in the UVA curriculum. A second exercise physiology (advanced) course is offered as an elective at UVA, the ODU program requires two exercise physiology courses for the curriculum.

Longwood University (LU)
LU offers a Bachelor of Science in Kinesiology.

Similarities
The science core classes are similar between ODU and Longwood with both requiring biology, physics, chemistry, anatomy and physiology. Psychology and 2 courses in exercise physiology are also required for both degree programs. Both programs offer a sports nutrition course.

Differences
The ODU program offers 2 tracks, internship and scientific foundations. The LU program does not offer these tracks, nor do they offer an internship course. Research methods is required for the LU program while it is only required in the scientific foundations option in the ODU program. The LU program requires a statistics course, while the ODU program does not.
Projected Resource Needs for the Proposed Program

Resource Needs

The Department of Human Movement Sciences will have sufficient resources to initiate and sustain the proposed program. The department has faculty, staff, equipment (with additional computer/peripherals for a new faculty position), space, and library resources (that have been available in the Bachelor of Science in Physical Education with a concentration in exercise science) to launch and sustain the proposed program. The program allocates 1 FTE of instructional effort for every 20 FTE of enrollment. Therefore, 7 FTE of instructional effort will be required when the program is launched and into the target year.

Full-time faculty
There are three faculty members whose current teaching load is dedicated to the existing BS in Physical Education with an exercise science concentration. In addition, two additional lecturers will be hired for the exercise science concentration in fall 2018. These faculty will be assigned to teach in the proposed program, with one having a course release each semester for advising work. Thus, 4.5 FTE faculty will teach in the proposed program at the outset and will continue into the target year.

Part-time faculty
Among the departmental faculty who are teaching in the exercise science major, four members’ teaching load is part time. These faculty members’ combined load is equivalent to 1 FTE. An additional .50 FTE in faculty support is contributed by the College of Sciences for core science courses.

Adjunct faculty
Two or three adjunct faculty per semester are required to launch and sustain the proposed program. Each year, the instructional contribution from these faculty represents 1 FTE, with a combined salary of $24,000 and FICA of $1,836.

Graduate Assistants
No graduate assistantships are required to launch and sustain the proposed program.

Classified Positions
There is currently one full-time classified position within the Department of Human Movement Sciences, an Administrative and Program Specialist III, who will assist faculty who teach in the BS in Exercise Science (20% of this position’s time, representing $6,000 in salary and $2,226 in benefits) with program needs. No additional resources are needed.

Targeted financial aid
No targeted financial aid is required or designated to initiate and sustain the proposed program.

Library
The University Libraries will be able to fully support the BS in Exercise Science. The primary search engine for locating research articles in the field is PubMed, which is available to all students and faculty at Old Dominion University. Major journals in the field include the

Telecommunications
No new telecommunications resources are required to launch and sustain the proposed program.

Space
No new space is required to launch and sustain the proposed program.

Equipment (including computers)
No additional equipment is required to launch and sustain the proposed program.

Other Resources (specify)
No additional resources are required to launch and sustain the proposed program.

PROJECTED RESOURCE NEEDS FOR PROPOSED PROGRAM

Part A: Answer the following questions about general budget information.

- Has or will the institution submit an addendum budget request to cover one-time costs?
  - Yes ______ No ___ X ___
- Has or will the institution submit an addendum budget request to cover operating costs?
  - Yes ______ No ___ X ___
- Will there be any operating budget requests for this program that would exceed normal operating budget guidelines (for example, unusual faculty mix, faculty salaries, or resources)?
  - Yes ______ No ___ X ___
- Will each type of space for the proposed program be within projected guidelines?
  - Yes ___ X ___ No ______
- Will a capital outlay request in support of this program be forthcoming?
  - Yes ______ No ___ X ___
### Part B: Fill in the number of FTE and other positions needed for the program

<table>
<thead>
<tr>
<th></th>
<th>Program Initiation Year</th>
<th>Expected by Target Enrollment Year</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>2019-2020</td>
<td>2023-2024</td>
</tr>
<tr>
<td>On-going and reallocated</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Full-time faculty FTE*</td>
<td>3.50</td>
<td>4.50</td>
</tr>
<tr>
<td>Part-time faculty FTE**</td>
<td>1.50</td>
<td>1.50</td>
</tr>
<tr>
<td>Adjunct faculty</td>
<td>1.00</td>
<td>1.00</td>
</tr>
<tr>
<td>Graduate assistants (HDCT)</td>
<td></td>
<td>0.00</td>
</tr>
<tr>
<td>Classified positions</td>
<td>0.20</td>
<td>0.20</td>
</tr>
<tr>
<td>TOTAL</td>
<td>6.20</td>
<td>7.20</td>
</tr>
</tbody>
</table>

*Faculty dedicated to the program. **Faculty effort can be in the department or split with another unit. ***Added after initiation year.
### Part C: Estimated resources to initiate and operate the program

<table>
<thead>
<tr>
<th></th>
<th>Program Initiation Year</th>
<th>Expected by Target Enrollment Year</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>2019-2020</td>
<td>2023-2024</td>
</tr>
<tr>
<td>Full-time faculty salaries</td>
<td>$271,250</td>
<td>$77,500</td>
</tr>
<tr>
<td>fringe benefits</td>
<td>$100,634</td>
<td>$28,753</td>
</tr>
<tr>
<td>Part-time faculty (faculty FTE split with unit(s)) salaries</td>
<td>$117,500</td>
<td>$117,500</td>
</tr>
<tr>
<td>fringe benefits</td>
<td>$43,593</td>
<td>$43,593</td>
</tr>
<tr>
<td>Adjunct faculty salaries</td>
<td>$24,000</td>
<td>$24,000</td>
</tr>
<tr>
<td>fringe benefits</td>
<td>$1,836</td>
<td>$1,836</td>
</tr>
<tr>
<td>Graduate assistants salaries</td>
<td>$0</td>
<td>$0</td>
</tr>
<tr>
<td>fringe benefits</td>
<td>$0</td>
<td>$0</td>
</tr>
<tr>
<td>Classified Positions salaries</td>
<td>$6,000</td>
<td>$6,000</td>
</tr>
<tr>
<td>fringe benefits</td>
<td>$2,226</td>
<td>$2,226</td>
</tr>
<tr>
<td>Personnel cost salaries</td>
<td>$418,750</td>
<td>$77,500</td>
</tr>
<tr>
<td>fringe benefits</td>
<td>$148,289</td>
<td>$28,753</td>
</tr>
<tr>
<td>Total personnel cost</td>
<td>$567,039</td>
<td>$106,253</td>
</tr>
<tr>
<td>Equipment</td>
<td>$0</td>
<td>$0</td>
</tr>
<tr>
<td>Library</td>
<td>$0</td>
<td>$0</td>
</tr>
<tr>
<td>Telecommunication costs</td>
<td>$0</td>
<td>$0</td>
</tr>
<tr>
<td>Other costs</td>
<td>$0</td>
<td>$0</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td>$567,039</td>
<td>$106,253</td>
</tr>
</tbody>
</table>
Part D: Certification Statement(s)

The institution will require additional state funding to initiate and sustain this program.

Yes

Signature of Chief Academic Officer

X No

Signature of Chief Academic Officer

If “no,” please complete Items 1, 2, and 3 below.

1. Estimated $$ and funding source to initiate and operate the program.

<table>
<thead>
<tr>
<th>Funding Source</th>
<th>Program initiation year 2019 – 2020</th>
<th>Target enrollment year 2023 – 2024</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reallocation within the department (Note below the impact this will have within the department.)</td>
<td>$618,452</td>
<td>$618,452</td>
</tr>
<tr>
<td>Reallocation within the school or college (Note below the impact this will have within the school or college.)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Reallocation within the institution (Note below the impact this will have within the institution.)</td>
<td>$54,840</td>
<td>$54,840</td>
</tr>
<tr>
<td>Other funding sources (Specify and note if these are currently available or anticipated.)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

2. Statement of Impact/Funding Source(s). A separate explanation is required for each source used.

Reallocation within the department: The Department of Human Movement Sciences currently contains an existing budget that includes funding for the Bachelor of Science—Physical Education with a concentration in Exercise Science. These same funds will be used for the B.S. in Exercise Science. Funding for the concentration will be reallocated for the Bachelor of Science in Exercise Science. No adverse impact in the department is anticipated with this reallocation or with the new program.
Reallocation within the institution: Faculty in the College of Sciences will teach courses in biology, chemistry, physics, and anatomy & physiology to students in the proposed program. No adverse impact on the college is anticipated when the program is launched.


If resources are reallocated from another unit to support this proposal, the institution will not subsequently request additional state funding to restore those resources for their original purpose.

X Agree

________________________________________
Signature of Chief Academic Officer

_____ Disagree

________________________________________
Signature of Chief Academic Officer
### APPENDIX A
Sample Plan of Study for a Full-Time Student

<table>
<thead>
<tr>
<th>Freshman Fall Semester (13-16 credits)</th>
<th>Freshman Spring Semester (13-16 credits)</th>
</tr>
</thead>
<tbody>
<tr>
<td>ENGL 110C*</td>
<td>ENGL 211C, or 221C, or 231C*</td>
</tr>
<tr>
<td></td>
<td>3</td>
</tr>
<tr>
<td>MATH 102M, 103M, or 162M</td>
<td>BIOL 123N-124N</td>
</tr>
<tr>
<td></td>
<td>3</td>
</tr>
<tr>
<td>BIOL 121N-122N</td>
<td>Language &amp; Culture**</td>
</tr>
<tr>
<td>Oral Communication</td>
<td>0-3</td>
</tr>
<tr>
<td>Language &amp; Culture**</td>
<td>Information Literacy &amp; Research</td>
</tr>
<tr>
<td></td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>EXSC 225</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Sophomore Fall Semester (14 credits)</th>
<th>Sophomore Spring Semester (14 credits)</th>
</tr>
</thead>
<tbody>
<tr>
<td>BIOL 240 or 250</td>
<td>BIOL 241 or 251</td>
</tr>
<tr>
<td></td>
<td>4</td>
</tr>
<tr>
<td>Human Creativity</td>
<td>Philosophy and Ethics</td>
</tr>
<tr>
<td></td>
<td>3</td>
</tr>
<tr>
<td>PSYC 201S</td>
<td>EXSC 240</td>
</tr>
<tr>
<td></td>
<td>3</td>
</tr>
<tr>
<td>CHEM 121N-122N</td>
<td>CHEM 123N-124N</td>
</tr>
<tr>
<td></td>
<td>4</td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>Junior Fall Semester (16 credits)</th>
<th>Junior Spring Semester (16 credits)</th>
</tr>
</thead>
<tbody>
<tr>
<td>PHYS 111N</td>
<td>Interpreting the Past</td>
</tr>
<tr>
<td></td>
<td>4</td>
</tr>
<tr>
<td>EXSC 250</td>
<td>Literature</td>
</tr>
<tr>
<td></td>
<td>3</td>
</tr>
<tr>
<td>EXSC 326</td>
<td>EXSC 327</td>
</tr>
<tr>
<td></td>
<td>3</td>
</tr>
<tr>
<td>EXSC 408</td>
<td>EXSC 366</td>
</tr>
<tr>
<td></td>
<td>1</td>
</tr>
<tr>
<td>Upper-Level General Education</td>
<td>EXSC 322</td>
</tr>
<tr>
<td></td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>Upper-Level General Education</td>
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<tr>
<td></td>
<td>3</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Senior Fall Semester (14-17 credits)</th>
<th>Senior Spring Semester (12 credits)</th>
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<tbody>
<tr>
<td>EXSC 415</td>
<td>EXSC 368</td>
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<tr>
<td>EXSC 417W*</td>
<td>12</td>
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<td>EXSC 428</td>
<td>or</td>
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<td>EXSC 431W*</td>
<td>PHYS 112N</td>
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<td>STAT 130M**</td>
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<td>EXSC 420</td>
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<td>Electives</td>
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</tbody>
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*Grade of C or better required
** May be waived
***Prerequisite for EXSC 420

Total: 112-121 credits
Electives, if needed to reach 120 credits
Sample Plan of Study for a Part-Time Student

First Year Fall Semester (7 credits)
ENGL 110C* 3
BIOL 121N-122N 4

Second Year Fall Semester (7 credits)
ENGL 211C, or 221C, or 231C* 3
BIOL 240 or 250 4

Third Year Fall Semester (7 credits)
CHEM 121N-122N 4
Human Creativity 3

Fourth Year Fall Semester (9 credits)
PSYC 201S 3
Interpreting the Past 3
EXSC 240 3

Fifth Year Fall Semester (9 credits)
Philosophy & Ethics 3
EXSC 322 3
Upper-Level General Education 3

Sixth Year Fall Semester (7 credits)
EXSC 327 3
EXSC 366 1
EXSC 408 3

Seventh Year Fall Semester (7-10 credits)
EXSC 417W 4
EXSC 428 3
Foreign Language** 3

First Year Spring Semester (7 credits)
BIOL 123N-124N 4
MATH 102M, 103M or 162M 3

Second Year Spring Semester (7-10 crdts)
BIOL 241 or 251 4
EXSC 225 3
STAT 130M*** 3

Third Year Spring Semester (7 credits)
CHEM 123N-124N 4
Oral Communication 3

Fourth Year Spring Semester (9 credits)
Literature 3
EXSC 250 3
Information Literacy & Research 3

Fifth Year Spring Semester (7 credits)
PHYS 111N 4
EXSC 326 3

Sixth Year Spring Semester (7 credits)
EXSC 415 4
Upper-Level General Education 3

Seventh Year Spring Semester (3-6 crdts)
EXSC 431W 3
Foreign Language** 3

Eighth Year Fall/Spring (12 credits)
EXSC 368 12 or
PHYS 112N/EXSC 420/Elec 12

Total: 112-121 credits
Electives, if needed to reach 120 credits

*Grade of C or better required
** May be waived
***Prerequisite for EXSC 420
APPENDIX B
Course Descriptions

Exercise Science Professional Core

EXSC 225: Introduction to Exercise Science (3 credits)
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.

EXSC 240: Prevention and Care of Injuries Related to Physical Activity (3 credits)
Practice in the skills of injury recognition and evaluation and training in cardiopulmonary resuscitation. Principles and uses of therapeutic modalities are also discussed.

EXSC 250: Strength and Conditioning Leadership (3 credits)
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.

EXSC 332: Anatomical Kinesiology (3 credits)
Anatomical and mechanical analysis of human musculoskeletal function including skeletal, muscular, and neuromuscular control aspects necessary for movement.

EXSC 326: Exercise Physiology I (3 credits)
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.

EXSC 327: Exercise Physiology II (3 credits)
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.

EXSC 366: Exercise Science Seminar (1 credit)
Seminar will include resume and cover letter writing skills, internship requirements, agency placement referrals, interviewing techniques, and certification options.

EXSC 408: Nutrition for Fitness and Sport (3 credits)
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.
EXSC 415: Exercise Testing for Normal and Special Populations (4 credits)
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.

EXSC 417W: Anatomical Kinesiology (4 credits)
Application of physical laws and mechanical principles to the human musculoskeletal system. (This is a writing intensive course.)

EXSC 431W: Wellness Programming and Administration (3 credits)
This course provides an introduction to the principles of administration and implementation of fitness and wellness programs to individuals, groups, centers, and corporate settings.

Science Core

BIOL 121N: General Biology I (3 credits)
An introduction to the process of science, biological molecules, cell biology, metabolism, molecular biology, and Mendelian genetics.

BIOL 122N: General Biology I Lab (1 credit)
A lab course emphasizing the process of science, biological molecules, cell biology, metabolism, molecular biology, and Mendelian genetics.

BIOL 250: Human Anatomy and Physiology I (4 credits)
This course emphasizes the gross anatomical relationships and the molecular, cellular, physiological, and metabolic process of the integument, musculoskeletal, neural, and immune systems.

BIOL 251: Human Anatomy and Physiology II (4 credit)
This course emphasizes the physiology and pathophysiology of the cardiac, pulmonary, renal, endocrine, and reproductive systems.

CHEM 121N: Foundations of Chemistry I (3 credits)
This is the first of a two-course series, designed for science and engineering majors, that prepares the student for subsequent studies in molecular science and constitutes the foundation for all upper-level chemistry courses. Topics include the descriptive chemistry of selected elements, modern atomic and molecular structure, stoichiometry, thermochemistry, and gas laws.

CHEM 122N: Foundations of Chemistry I Lab (1 credit)
Laboratory experiments are designed to complement the topics presented in the companion lecture course, CHEM 121N.

CHEM 123N: Foundations of Chemistry II (3 credits)
This is the second of a two-course series, designed for science majors, that prepares the student for subsequent studies in molecular science and constitutes the foundation for all upper-level
chemistry courses. Topics include states of matter, solutions, electrochemistry, thermodynamics, equilibria, and kinetics.

**CHEM 124N: Foundations of Chemistry II Lab** (1 credit)
Laboratory experiments are designed to complement the topics in the companion lecture course,

**PHYS 111N: Introductory General Physics** (4 credits)
Emphasizes mechanics, wave motion and heat and will also cover the needed elements of trigonometry and vectors.

**Preventive/Rehabilitative Exercise Option**

**EXSC 368: Internship** (12 credits)
Students will be placed in an agency to gain experience in methodologies, administration techniques, and programs specific to their area of interest. Minimum of 400 clock hours.

**Scientific Foundations of Exercise Option**

**STAT 130M: Elementary Statistics** (3 credits)
Topics include: data description, elementary probability, binomial and normal distributions, interval estimation, hypothesis testing, and correlation. The role of probability in inference is emphasized.

**PHYS 112N: Introductory General Physics** (4 credits)
Emphasizes electricity, light, and introduction to modern physics.

**EXSC 420: Research Methods in Exercise Science** (3 credits)
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.
APPENDIX C
Abbreviated Curriculum Vitae for Faculty

Hunter Bennett, PhD in Kinesiology and Sport Studies, 2016, University of Tennessee. Assistant Professor. Specialization area: biomechanics

David Branch, PhD in Exercise Science, 1993, University of South Carolina. Associate Professor. Specialization area: exercise physiology

Laura C. Hill, PhD in Exercise and Sport Science, 2006, University of Utah. Lecturer. Specialization area: exercise physiology

Leryn Reynolds, PhD, in Exercise Physiology, 2014, University of Missouri. Assistant Professor. Specialization areas: cardiometabolic responses to exercise; vascular alterations to physical inactivity.

Philip Sabatini, MS in Recreation and Sport Sciences, 2007, Ohio University. Lecturer. Specialization areas: strength and conditioning; kinesiology

David Swain, PhD in Physiology, 1984, University of North Carolina Medical School. Professor. Specialization area: cardiovascular exercise physiology

Patrick Wilson, PhD in Kinesiology, 2014, University of Minnesota. Assistant Professor. Specialization area: sport nutrition

Lecturer positions (2), fall 2018, graduate degree in exercise science or related discipline.
APPENDIX D
Employment Demand—Letters of Support
APPENDIX E
Employment Demand—Job Postings