

**Undergraduate Programs**  
**In Exercise Science / Exercise Physiology**  
Issues and Concerns

Tommy Boone, PhD, MPH, FASEP, EPC  
Professor and Chair  
Director, Exercise Physiology Laboratories  
Department of Exercise Physiology  
The College of St. Scholastica  
Duluth, MN

The undergraduate programs for students who want careers in adult fitness, cardiac rehabilitation, exercise physiology, sports psychology, and sports biomechanics are located in departments with a dozen or more different names with a variety of possible academic majors. The inconsistency from one institution to the next is problematic both for the students and the departments. Everything is changing but the world of exercise science. It is within this context that exercise physiology, as an emerging profession, is currently facing a major uphill battle. In the United States, the promise of careers is weak and poorly defined. This concern also goes beyond the students to the ethics of continuing the present structure of the undergraduate programs. Newer thinking, restructuring, and delivery are imperative to reduce the uncertainty in the worth of such programs.

This article presents a random sample of institutions that demonstrates the many different names for the undergraduate degree programs that are frequently associated with exercise physiology. Note that the title “exercise physiology” is used and not “exercise science” even though different institutions may not use the professional career-oriented title. Many college graduates refer to themselves as an “exercise physiologist” and not an “exercise scientist” or even an “exercise specialist”. Having said this though, the specific undergraduate degree and/or academic emphasis for each department and/or institution will be identified for comparison purposes. At no time is the information meant to be negative in regards to a particular institution. Instead, it is my hope that the information will be the first of many articles by different

exercise physiologists who are committed to a vision that supports the professionalism of exercise physiology. Change is inevitable.

For comparison purposes, Table 1 identifies the sample (N = 62) of institutions by name and location, the department name (and whether it is part of a School or College), the undergraduate major, and whether the major requires a specialization (or program option).

**Table 1**

<b>Institution Name</b>	<b>School / College / Department Name</b>	<b>Academic Major (Bachelor's degree)</b>	<b>Specialization</b>
Abilene Christian University	Department of Exercise Science and Health	Exercise Science	
Adelphi University	Department of Health Studies, Physical Education and Human Performance Science	Physical Education	
Andrews University	Department of Physical Education	Physical Education	Exercise Science
Appalachian State University	Department of Health, Leisure and Exercise Science	Exercise Science	
Arizona State University	Department of Exercise Science and Physical Education	Exercise Science and Physical Education	
Arkansas State University	Department of Health, Physical Education, and Sports Sciences	Physical Education	Exercise Science
Auburn University	Department of Health and Human Performance		
Brigham Young University	Department of Physical Education	Physical Education	Exercise Science
Campbell University	Department of Exercise Sciences	Exercise Science	
Chapman University	Department of Kinesiology	Kinesiology	Exercise Physiology
College of St. Scholastica	Department of Exercise Physiology	Exercise Physiology	
Colorado State University	Department of Health and Exercise Science	Health and Exercise Science	

Concordia University	Department of Exercise Science	Exercise Science	
Creighton University	Department of Exercise Sciences	Exercise Science	
Fort Lewis College	Department of Exercise Science	Exercise Science	
Gannon University	Department of Sport and Exercise Science	Sport and Exercise Science	
Grand Canyon University	Department of Health, Exercise Science, and Physical Education	Corporate Fitness and Wellness	Exercise Science minor
Humboldt State University	Department of Health and Physical Education	Exercise Science	
Jacksonville State University	Department of Health, Physical Education and Recreation	Exercise Science and Wellness	
Kennesaw State University	Department of Health, Physical Education and Sport Science	Exercise and Health Science	Exercise Specialist
Louisiana State University	Department of Kinesiology	Kinesiology	Fitness Studies
Marquette University	Program in Exercise Science	Exercise Science	
Morehead State University	Department of Health, Physical Education, and Recreation	Exercise Science	
Old Dominion University	Department of Exercise Science, Physical Education, and Recreation	Exercise Science	
Oregon State University	Department of Exercise and Sport Science	Exercise and Sport Science	Applied Exercise and Sport Science
Penn State University	Department of Kinesiology	Kinesiology	Movement Sciences
Purdue University	Department of Health, Kinesiology, and Leisure Studies	Exercise and Fitness	
Radford University	Department of Physical Education and Health Education	Physical Education	Commercial Fitness

Rice University	Department of Kinesiology	Kinesiology	Exercise Science
Samford University	Department of Exercise Science and Sports Medicine	Exercise Science	
Southern Illinois University	Department of Physical Education	Physical Education	Exercise Science and Physical Fitness
Syracuse University	Department of Exercise Science	Health and Exercise Science	
Temple University	Department of Physical Education and Kinesiology	Exercise Science and Wellness	
Tulane University	Department of Exercise and Sport Sciences	Exercise Science	
Vanguard University	Department of Exercise and Sports Science	Exercise and Sports Science	Sports Science
University of Buffalo	Department of Physical Therapy, Exercise and Nutrition Sciences	Exercise Science	
University of Connecticut	Department of Kinesiology	Exercise Science	Exercise Physiology
University of Dayton	Department of Health and Sport Science	Exercise Science and Fitness Management	
University of Delaware	Department of Health and Exercise Sciences	Exercise and Sports Science	Exercise Physiology
University of Georgia - Athens	Department of Exercise Science	Exercise and Sport Science	Pre-Graduate Study in Exercise Physiology
University of Florida	Department of Exercise and Sport Sciences	Exercise and Sport Sciences	Exercise Physiology
University of Houston	Department of Health and Human Performance	Kinesiology	Exercise Science
University of Louisville	Department of Health Promotion, Physical Education, and Sport Studies	Physical Education	Exercise Science and Sports Medicine
University of Iowa	Department of Exercise Science	Exercise Science	

University of Wisconsin - Madison	Department of Kinesiology	Kinesiology	Exercise Science
University of Maryland – College Park	Department of Kinesiology	Kinesiological Sciences	Corporate Fitness and Wellness
University of Massachusetts	Department of Exercise Science	Exercise Science	
University of Mississippi	Department of Exercise Science	Exercise Science	
University of New Hampshire	School of Health and Human Services	Kinesiology	Exercise Science
University of North Carolina - Greensboro	Department of Exercise and Sport Science	Exercise and Sport Science	Fitness Leadership
University of North Dakota	Department of Physical Education and Exercise Science	Physical Education	
University of Texas - Arlington	Department of Exercise, Sport, and Health Science	Exercise Science	
University of Utah	Department of Exercise and Sport Science	Exercise and Sport Science	Exercise Physiology
University of Wisconsin - Milwaukee	Department of Human Kinetics	Kinesiology	Exercise and Fitness
Ursinus College	Department of Exercise and Sport Sciences	Exercise and Sport Sciences	Exercise Science
Utah State University	Department of Health, Physical Education and Recreation	Physical Education	Exercise Science
Wake Forest University	Department of Health and Exercise Science	Health and Exercise Science	
Warber Southern College	Department of Physical Education	Exercise Science	
Wichita State University	Department of Kinesiology and Sports Sciences	Exercise Science	

The list is interesting. It shows that under the topic “exercise science / exercise physiology” there are considerable differences both in the name of the

department and the title of the academic degree. There are at least 30 different department names that offer at least 9 different academic degrees (refer to Table 2 for the degrees), yet the graduates from these institutions generally identify themselves as exercise physiologists.

**Table 2**

Exercise Science (22)	Exercise Science and Wellness (4)
Physical Education (9)	Exercise and Fitness (2)
Exercise and Sport Science (8)	Kinesiological Sciences (2)
Kinesiology (8)	Exercise Physiology (1)
Health and Exercise Science (6)	

### What is the Problem?

The large number of different department names suggests that any academic department can offer an exercise physiology program of study. It is easy to do. All the chair of any department has to do is announce that students can get an education in exercise science (and therefore, exercise physiology). As such, then, it does not matter whether the department has an exercise physiology faculty or not. Why? Because exercise science is not exercise physiology! Also, as evident in much of the Internet documents that describe the different departments, the title exercise science is used to replace the older title “physical education”.

If the department offers exercise science and allows the students to believe they will graduate as exercise physiologists, it is a problem. The problem is that not just any department can graduate exercise physiologists. The department must offer an academic degree in exercise physiology. While, admittedly, the random sample of 62 departments is small, it does indicate that only one department in the sample offers an undergraduate academic degree in exercise physiology. Students graduating from that institution have the right to refer to themselves as exercise physiologists.

The question is, “Who is legitimate?” For those who do not have an undergraduate degree in exercise physiology, when such a degree exists, they are not exercise physiologists. The logic here is no different than a select group of students who enroll in a concentration of nursing courses and, then, refers to themselves as “nurses”. Hello, wake up world. Everyone knows that the students would not be allowed to do so, and the school could not get by with suggesting the same. Only individuals with a nursing degree can be referred to as a nurse. It really is that simple.

Unfortunately, the fact that exercise physiologists have not had their own professional organization has allowed for considerable confusion. The potential for misrepresentation is high, and the public sector does not benefit from extreme examples outlined in Table 1 and the variety of degrees presented in Table 2. So, the question could be, “What is your profession?” Without the obvious being overplayed, again, if a person does not have a degree in exercise physiology, that individual is not an exercise physiologist. Similarly, should an individual from medicine, physiology, or physical therapy engage in exercise physiology research and/or teach exercise physiology courses, that person is not an exercise physiologist either (i.e., if the individual does not have an academic degree in exercise physiology).

The question “Who is legitimate?” bears repeating. For those who are not academically prepared (either with a degree or a valid academic emphasis) as an exercise physiologist, they are not legitimate. Hence, calling oneself an exercise physiologist when his/her degree is in kinesiology, or physical education, or sport science, human performance, or even medicine is incorrect. The American Society of Exercise Physiologists *has defined an exercise physiologist as a person who has completed at least a bachelor's degree (or emphasis) in exercise physiology (science)*. Note, for a variable period of time, that exercise “science” is acceptable. At some point in the near future, it is very likely that “science” will be replaced by “physiology” to establish confidence in the public’s mind and to assure the integrity of the emerging *exercise physiology* (not exercise science) profession.

It is not logical that an academic degree such as exercise science should still be considered under the umbrella term “kinesiology”. In short, the thinking and the effort to substitute kinesiology for physical education and the entire field of human movement, sport, and exercise science are bad. Understandably, kinesiology implies the study of human movement but it is no longer straight thinking to suggest that kinesiology, as an academic discipline, includes exercise physiology along with biomechanics, sports medicine, motor learning, sports psychology, fitness and wellness, and coaching.

Physical educators are likely to seek professional career in teaching and coaching in grades K-12; whereas, exercise physiologists do not. If exercise science implies exercise physiology, as is usually the case, then an exercise science major (or emphasis) is usually designed for those students interested in (but not limited to) careers in exercise, fitness, and wellness promotion in clinical, preventive, rehabilitative, athletics and sports, and industrial and laboratory settings. Here again, kinesiologists (or the more traditional title, physical educators) are not usually the professionals who administer protocols commonly used to assess health and fitness performance. They are not usually engaged in the analysis of health risk factors, lifestyle management, stress test protocols, cardiopulmonary and metabolic tests, exercise prescriptions and, in general, careers in corporate fitness, adult fitness, cardiac rehabilitation, and related clinical programs. Physical educators are also less likely candidates to engage in research in exercise physiology at colleges and universities.

Other areas of confusion lie in the stated purpose of an academic program. For example, the following statement: “The purpose of the exercise physiology program emphasis is to acquaint the student with physiological concepts related to the acute and chronic effects of exercise on human subjects.” Is the purpose of a college education to *acquaint* students with the content of a profession? Or, is the purpose of an exercise physiology program to lead to employment in the field of exercise physiology? These are two very important but different questions. On one hand, the chair and faculty state up front that the purpose of the degree (or emphasis) is to acquaint students with the content of



the exercise physiology profession. In so doing, they also protect themselves from being accused later that the college education was useless in accessing a good job in the public sector. Who loses, the students! In effect, the chair and faculty have excused themselves from doing the right job in the first place. The victims, the students, are told that more education is needed to land a job. They do not realize that the chair and faculty of these departments assume no responsibility for them not having secured a job in cardiac stress testing, directors of adult fitness programs, cardiac rehabilitation programs, health maintenance/health improvement in corporate, industrial, and educational settings.

The faculty usually devote their time and thinking to research, graduate education, and service. Research projects are designed to yield information for publication in the scientific literature and for presentation at professional meetings. Students become personal trainers or exercise specialists. Seldom is the education sufficient or credible to warrant the title exercise physiologist. Instead, students are told that they are prepared for graduate study in allied medical fields such as physical therapy, physicians assistants, cardiac rehabilitation, and pre-medicine or, perhaps, related fields of study in sport history, sport management, sport psychology, motor behavior, or even exercise physiology. Welcome to the reality of confusion, *mis*-information, and *mis*-direction.

By contrast in thinking, "Are physical therapy programs dedicated to promoting and integrating scientific and clinical research and education on the function and dysfunction of the human body?" The answer is no. Physical therapy programs are dedicated to graduating physical therapists. It is that plain and simple. Nursing programs produce nurses. Occupational therapy programs produce college graduates who access professional careers in occupational therapy. Exercise science faculty and departments do not produce exercise physiologists. By now, this specific point should be understood. Instead, they are dedicated to promoting and integrating scientific research and education on the health benefits of exercise. Students are prepared to learn the dogma of

acute and chronic effects of exercise. They are not taught that the education defines a specific profession or a specific career. The argument is that exercise science provides a scientific knowledge base for entry into professional programs. Or, the primary goal of such programs is to prepare students for graduate study in the so-called exercise science sub-disciplines (such as biomechanics, exercise physiology, motor behavior).

Only at the doctoral level is there some indication that the mission of the program in exercise science is to prepare scholars for “careers” in exercise science research and college teaching at all levels. Frequently, students with the undergraduate degree are told that they are not eligible to think about a career. They are not even allowed the title “exercise physiologist” (according to some PhD exercise physiologists) even should they have an actual academic degree in exercise physiology. Such thinking is obviously outdated and useless. It serves little to help the students, regardless of the fact the faculty of these institutions may be exciting and challenging professors. They may be superb scholars and teachers. They may have achieved national recognition in the field, but if they demonstrate little concern for the problems of their students, then, as advisors and mentors, their professional service is lacking.

The chair and faculty of departments that produce exercise physiologists, whether correct or not, should recognize their obligation to maintain a spirit of professional community. Aside from the obvious importance to engage in scholarly research and diversity of ideas, it is important that they recognize their obligation to the students. They should organize the purpose of the department and its academic programs to specifically prepare exercise physiologists with career expectations in exercise physiology. If the department offers an exercise physiology degree, then the purpose of the degree should be to locate a professional job in exercise physiology. If it does not offer an exercise physiology major (or an intensive academic emphasis), then the department and faculty should clarify the fact that the graduates are not exercise physiologists.

As an example, consider the following statement on the Internet: “Our faculty include leading scholars in the field of kinesiology. They are editors,

associate editors, and reviewers for major research journals in the field. They have received many prestigious teaching awards and hold many offices in respected professional organizations.” Okay, what is the name of the department? Kinesiology. What are the scholars? Kinesiologists. So, if they have a major in kinesiology with a concentration in exercise and sport, can the Department of Kinesiology and its dedicated faculty graduate exercise physiologists? The only correct answer is NO. The answer is still no even if the concentration is exercise science, especially since the typical exercise science concentration is a non-teaching physical education degree with a couple courses in fitness and wellness. It is also important to remember that work as a fitness specialist in a commercial fitness club or in an YMCA/YWCA or other programs (including rehabilitation) do not entitle the individual(s) to the title exercise physiologist.

It is clear that the emerging exercise physiology profession and its dedicated advocates must help others understand: (1) that exercise science is not exercise physiology; (2) that the study of exercise science is not the study of exercise physiology; (3) that exercise physiologists are not exercise scientists but rather exercise physiologists; (4) that the study of the scientific aspects of exercise and sport, exercise training on the body and mind, and how to develop better athletes and healthier citizens is not the intention of the exercise physiology degree; and (5) that a concentration in exercise science is not the same thing as an academic degree in exercise physiology.