



## Human Biology | 2016-2017 Assessment Report

1. Please give a brief overview of the assessment data you collected this year.

Kinesiology provides an in depth study of the human musculoskeletal system as it pertains to movement of the body and/or its parts. There are three major components to this course - anatomy (detailed musculoskeletal anatomy), functional anatomy (understanding bodily movement in light of anatomical structure), and biomechanics (mathematical quantification of bodily movement, forces, etc.).

Evaluating the student's understanding of biomechanics is a cumulative process throughout the entire course. Students complete four assignments during the course; Assignment 1 and Assignment 4 are specifically composed of biomechanical problems, which relate to linear and angular motion. During the fall 2016 semester, 24 students were enrolled in the course (one student withdrew and one student took an incomplete grade). There was a 10% grade improvement from Assignment 1 to Assignment 4 (Mean + SEM = 8.08 + 0.29 (Assignment 1) and 9.00 + 0.31 (Assignment 4);  $p=0.035$ ), which suggests that students had an improved understanding of the biomechanical concepts and their application.

Furthermore, 28% of the final exam included cumulative biomechanical problems, which built on concepts that were integrated throughout the entire semester. The average score on the biomechanics portion of the final exam was 83.36% (N=22). Thirteen students scored 90-100%, four students scored 80-90%, three students scored 70-80%, and two students scored lower than 20%.

Exercise Physiology involves studying the respiratory, cardiovascular, muscular, endocrine and metabolic response to exercise. Weekly laboratories support principles from lecture (and visa versa), but they have a more quantitative component. For each of the related physiological system, students learn the acute and chronic responses to exercise. This translates into learning the immediate (what happens during exercise) and long term (what happens as a consequence of exercise training) response to exercise.

Scores on quizzes and lecture exams indicate that over 15% of students have an excellent understanding of the physiology that supports exercise (interactions of exercise and human physiology). Forty-five percent had an above average understanding, 35% an average understanding, and 5% a poor understanding of the physiology that supports exercise.

Additionally based on lab reports and lab exams, 20% of students demonstrated a high level of competence in assessing (and interpreting) the physiological response to exercise, e.g., ability to assess blood pressure, oxygen consumption, anaerobic capacity, and EKG response to exercise). Fifty five percent had an above average ability, 20% an average ability, and 5% a

poor ability to assess and interpret the physiological response to exercise.

Students understanding of and ability to assess the physiology response of exercise is further validated in students' completing 4 successful group research projects. Three of these projects were presented as posters at the 2018 undergraduate research symposium.

Sports Physiology involves studying the practical application of "exercise physiology". There are 3 components to the course – energy system, principles of training, and response to the ergogenic aids and/or the environment. Energy systems involves learning about the three "energy systems" that support exercise, e.g., lactic acid system and the energy capacity of the human body. Principles of training involves learning how to exercise train for various purposes/techniques (strength training, interval training, aerobic training). Response to the ergogenic aids/environment involves learning the physiology and impact of ergogenic aids, gender, and the environment on the physiology of exercise and/or exercise capacity.

Based on exams, quizzes, assignments, and a review of a meta-analysis, over 28% of students have an excellent understanding of the physiology that supports exercise (interactions of exercise and human physiology). Fifty six percent have an "average understanding, and 16% have a poor understanding (this includes 2 students who rarely came to class).

2. How will you use what you've learned from the data that was collected?

Performance in individual courses suggests that the vast majority of students are doing very well in terms of this outcome. To continue this level of success, Human Biology plans to continue to build on the knowledge and skills of the students. To do so, professional development opportunities for faculty/staff and retaining/hiring quality staff/faculty are critical to continue and build upon the success of the program outlined in this report. A recent hire for the fall of 2017, Dr. Douglas Brusich, has expertise in human physiology and will assist our program achieve this goal.