EXERSCI 201
Exercise Physiology 1
(15 points)
(Semester 1, City Campus)

Prerequisites: 30 points from BIOSCI 107, EXERSCI 101, 103, MEDSCI 142, SPORTSCI 101, 103

Who should take this course?

If you are interested in the science of how the human body performs, recovers from and adapts to habitual sport or exercise (or even the lack of it), then you will benefit from this course.

This course is a required course within the BSc Exercise Sciences major.

This first course in Exercise Physiology addresses the physiological underpinnings of how acute and chronic exercise alters the structure and function of the human body. Students are introduced to exercise metabolism and the neuromuscular system and the responses and adaptations of these systems to exercise or inactivity. Because this course addresses the physiological requirements and consequences of voluntary physical exercise, it is highly recommended that students have a background in basic human physiology (e.g., BIOSCI 107 and MEDSCI 142). It is expected that all students have a background in fundamental human anatomy, biology and chemistry. A capability with the biophysical foundations of Exercise Sciences (EXERSCI or SPORTSCI 101 and a familiarity with the scientific bases of exercise prescription (EXERSCI or SPORTSCI 105) are also recommended.

Learning Outcomes

At the completion of this course, a student would be expected to:

1) Understand the physiological and biochemical requirements and provision of energy (metabolism) for exercise, recovery and adaptation.
2) Understand how muscular force and power are generated and controlled, and how the neuromuscular system adapts to its habitual use.
3) Have acquired skills in calibrating and using ergometers/exercise equipment to measure force, work and power and making valid and accurate measurements of resting, submaximal and maximal oxygen consumption.
4) Have experienced and developed an understanding of the justification, planning, conduct and reporting of experimental procedures with human participants to address scientific questions in exercise physiology.
Learning and Teaching

This course introduces the basics of exercise metabolism and the neuromuscular system and the responses and adaptations of these systems to exercise or inactivity. Laboratory classes include the physiological measurement of neuromuscular force, work and power, anaerobic and aerobic metabolism and skeletal muscle structure. In short, this course is about ENERGY and MOVEMENT.

Students are expected to attend two 1-hour lectures each week (City Campus). Lectures on ENERGY cover objectives addressing energy sources and substrates, energy provision and exercise demands. The non-oxidative and oxidative metabolic pathways and the catabolism and anabolism of carbohydrates, fats and proteins with respect to the nature of exercise and recovery are addressed specifically and collectively. The value of a scientific understanding of metabolism in evaluating or applying interventions, particularly exercise training, to alter energy balance, substrate use, body composition and/or the performance of sport or exercise is emphasized. Lectures on MOVEMENT cover objectives addressing how muscular force and power are generated and controlled by central and peripheral components of the neuromuscular system. The responses of the neuromuscular system to intense or prolonged exercise and the structural and functional adaptations to differing modes of exercise training are then addressed.

Students are expected to attend eight 3-hour laboratory classes. These laboratory classes are a key component to learning and applying the lecture material, using scientific equipment and developing data collection, exercise prescription and physiological assessment skills with human participants (you and your classmates). Above all, a first-hand, scientific perspective (evidence) of how the human body performs and responds to different forms of exercise is gained. Students will write a laboratory test including the physiological basis, analysis and interpretation of data from their experiments and submit complete laboratory reports for two group-planned and conducted experiments.

Office hours and on-line communications via CANVAS are available for student support at key (pre-assessment preparatory) times or by pre-arrangement, within the semester.

Teaching Staff

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Assessment

Examination  
Midterm Test (15%)  
Final Examination (50%)

Coursework

Laboratory Test (10%)  
Laboratory Reports (25%)

Recommended Textbooks


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