

HKIN 562 Bioenergetics of Physical Activity

Instructor: Michael Koehle, MD PhD.

Office: Med Block C 118 **Office Hours:** Mondays 4-5pm by appt.

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When: Mon 5:00 - 8:00 pm (**Term 1, 2014**)

Where: WarMem Gym room 208

Prerequisites

Students should have some background in exercise physiology. This background could comprise an undergraduate course in exercise physiology or human physiology.

Course description

This course will initially explore the basic energy systems of the human body; primarily concentrating on the bioenergetics of the skeletal muscle cell, recovery from muscular work, substrate utilization, muscle fiber types, strength, endurance. We will then explore the relevant applied topics related to bioenergetics and performance.

Course text and materials

No textbook. The course will be based on on-line materials, scientific research papers and review articles, and guest speakers.

Course requirements and evaluation

Students will be expected to:

- 1) come prepared to participate in the in-class discussions and debates
- 2) provide a presentation for the class relevant to both their own thesis/major paper work and the course
- 3) participate in a class debate on a controversial area of bioenergetics
- 4) review or acquire basic exercise physiology concepts

Marks will be based on a combination of in-class presentation (40%), a final examination (60%).

Topics covered:

- 1) Energy Systems: Aerobic, Anaerobic Metabolism
- 2) Thresholds: Anaerobic, Lactate, and Ventilatory Thresholds
- 3) Performance Testing for Sport: aerobic, anaerobic, clinical populations
- 4) Nutrition for Sport
- 5) Bioenergetics and Doping
- 6) Overtraining and Overreaching
- 7) Training for Endurance Sport
- 8) Fluids and Exercise

Tentative Schedule:

This schedule is subject to change.

Date	Speaker	Topic I	Topic II
September 11, 2017	Michael Koehle	Intro to Bioenergetics	Energy and Energy Metabolism and Energy Systems
September 18, 2017	Michael Koehle	Introduction to Evidence	Discussion of papers (Cryotherapy)
September 25, 2017	Michael Koehle	Thresholds and aerobic Exercise Testing - Theory	Thresholds Aerobic Ventilatory Lactate
October 2, 2017	Michael Koehle	Testing in The Laboratory	
Thanksgiving			
October 16, 2017	Michael Koehle	Thresholds - Finish	Clinical Nutrition
October 23, 2017	Michael Koehle	Carbohydrates in Sport/ Nutrient Timing /HFLC, Low Carb Training, Metabolic Training	Presentations 1-3
October 30, 2017	Michael Koehle	Presentations 4-6	Hallowe'en
November 6, 2017	Michael Koehle	Muscle Protein Synthesis	Presentations 7-9
November 20, 2017	Michael Koehle	HFLC, Low Carb Training, Metabolic Training	Presentations 10-12
November 27, 2017	Michael Koehle	Evidence-Based Weight Loss	Presentations 13-14
November 27, 2017	Michael Koehle	Course Wrap-Up	Presentations 15-16
December 4, 2017	Michael Koehle	Final Exam	

Evaluation Standards:

High A (A+, A)

- 1) Required learning activities are completed.
- 2) All efforts display outstanding commitment to learning, including evidence of considerable independent research outside the class time.
- 3) Evidence of outstanding ability to analyze and synthesize relevant ideas, along with confirmation of the ability to critically assess & weigh alternative perspectives in an informed fashion.
- 4) Prepared materials represent original (to the learner) insight, thought or presentation and are organized logically and clearly expressed.
- 5) Cooperative engagement with peers and demonstrated leadership in learning
- 6) No deficiencies of note.

A-B (B+, A-)

- 1) Required learning activities are completed.
- 2) Efforts display a sound grasp of concepts.
- 3) Evidence of synthesis of relevant ideas, along with the ability to critically assess & weigh alternative perspectives in an informed fashion.
- 4) Prepared materials are organized logically and clearly expressed.
- 5) Cooperative engagement with peers
- 6) Minor difficulties that are developmental in nature.

B-C (B, B-, C)

- 1) Required learning activities are completed.
- 2) Efforts display a basic grasp of concepts.
- 3) Evidence of a basic ability to synthesize of relevant ideas, along with the ability to critically assess & weigh alternative perspectives in an informed fashion.
- 4) Prepared materials are organized logically and clearly expressed.
- 5) Cooperative engagement with peers.