

## **HKIN 562 Bioenergetics of Physical Activity**

**Instructor:** Normand Richard MSc

**Office:** N/A **Office Hours:** Mondays 9pm by appt.

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**When:** Mon 6:00 - 9:00 pm (**Term 1, 2018**)

**Where:** CEME 1206 (Civil and Mechanical Engineering Building, 6250 Applied Science Lane)

### **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 (50%) and a mark for participation (10%).**

### **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) Clinical Exercise Physiology
- 6) Overtraining and Overreaching
- 7) Training for Endurance Sport
- 8) Fluids and Exercise

**Tentative Schedule:**

*This schedule is subject to change.*

<b>Date</b>	<b>Speaker</b>	<b>Topic I</b>	<b>Topic II</b>
September 10	Normand Richard	Intro to Bioenergetics	Energy and Energy Metabolism and Energy Systems
September 17	Normand Richard	Introduction to Evidence	Discussion of papers (Cryotherapy)
September 24	Normand Richard	Guest Lecture (s) Sports Nutrition	
October 1	Normand Richard	Thresholds Aerobic Ventilatory Lactate, HR, Training Zones	
<b>October 8</b>	<b>Thanksgiving</b>		
October 15	Normand Richard	Practical Testing Session in The Laboratory	
October 22	Normand Richard	Clinical Exercise Physiology	Presentations 1-3
October 29	Normand Richard	Carbohydrates in Sport/ Nutrient Timing /HFLC, Low Carb Training, Metabolic Training	Presentations 4-6
November 5	Normand Richard	Muscle Protein Synthesis	Presentations 7-9
November 12	<b>UBC CLOSED</b>		
November 19	Normand Richard	Cramping and buffering in sport	Presentations 10-12
November 26	Normand Richard	Evidence-Based Weight Loss/Track cycling the perfect model?	Course Wrap-Up
December 3	Normand Richard	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.