HKIN 562  Bioenergetics of Physical Activity

Instructor: Michael Koehle, MD PhD.
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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.*

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