

<p><b>Course Name:</b>  <b>KNPE 339/3.0</b></p> <p>Advanced Exercise          Metabolism</p>	<p><b>Course Instructor:</b></p> <p>Dr. Brendon Gurd</p>	<p><b>Learning Hours:</b></p> <p>Lectures: 2 x 1.5 hrs/ 12 weeks</p>								
<p><b>Course Description:</b></p> <p>The focus of KNPE 339 is on aspects of skeletal muscle energy metabolism related to exercise and nutrition, with a particular emphasis on the regulation of carbohydrate and fat metabolism and the mechanisms regulating their use as substrates for muscle during rest and exercise. The use of nutrition and exercise in humans to assess the impact of these perturbations on whole body metabolism and related clinical disorders are also considered.</p>		<p><b>Prerequisite:</b></p> <p>Level 3 or above in a KINE or PHED Plan and KNPE 225/3.0 and KNPE 227/3.0</p>								
<p><b>Intended Student Learning Outcomes:</b></p> <ul style="list-style-type: none"> <li>• Advanced understanding of mechanisms underlying classic and current topics in exercise metabolism</li> <li>• Gain a cursory knowledge of the methodology used in exercise metabolism</li> <li>• Understand both results and methodologies presented in primary references from exercise metabolism:             <ul style="list-style-type: none"> <li>○ Utilize primary articles as a reference material;</li> <li>○ Efficiently extract study methodologies (subjects, experimental protocols, materials and methods);</li> <li>○ Interpret results within the contexts of 339, exercise metabolism, and health.</li> </ul> </li> <li>• Develop problem statements that integrate physiological models and test speculative propositions using primary references from exercise metabolism</li> <li>• Independently learn and integrate information on selected topics in exercise metabolism</li> </ul>		<p><b>Exclusion:</b></p> <p>KNPE 427/3.0</p> <p><b>Course Texts:</b></p> <p>There is no textbook for this course.</p> <p>Course notes will be posted on OnQ.</p> <p><b>Course Evaluation:</b></p> <table border="0" style="width: 100%;"> <tr> <td>Multiple choice tests (3 x 10%)</td> <td style="text-align: right;">30%</td> </tr> <tr> <td>Problem Solving Assignments</td> <td style="text-align: right;">10%</td> </tr> <tr> <td>Video Presentations (3 x 10%)</td> <td style="text-align: right;">30%</td> </tr> <tr> <td>Final exam</td> <td style="text-align: right;">30%</td> </tr> </table>	Multiple choice tests (3 x 10%)	30%	Problem Solving Assignments	10%	Video Presentations (3 x 10%)	30%	Final exam	30%
Multiple choice tests (3 x 10%)	30%									
Problem Solving Assignments	10%									
Video Presentations (3 x 10%)	30%									
Final exam	30%									
<p><b>Course Outline</b></p>										
<p>ATP production and carbohydrate metabolism</p>	<p>Impact of detraining/what exactly happens in sedentary muscle?</p>									
<p>Exercise intensity and substrate utilization (Fatty Acid)</p>	<p>Oxidative stress in health and disease</p>									

Problem solving	Mitochondrial content and health
Training and exercise substrate selection	Liver and adipose tissue in insulin resistance
Mitochondrial respiration	Inflammation and T2D
Mechanisms controlling mitochondrial content	Curing T2D
Exercise intensity and mitochondrial biogenesis	