

<p><b>Course Name:</b> <b>KNPE 429/3.0</b></p> <p>Skeletal Muscle Oxygen Delivery: Demand Matching in Exercise</p>	<p><b>Course Instructor:</b></p> <p>Dr. Michael Tschakovsky</p>	<p><b>Contact Hours:</b></p> <p>Winter 2021 – Remote Delivery</p> <hr/> <p><b>Prerequisite:</b></p> <p>KNPE 125/3.0, KNPE 225/3.0; and KNPE 227/3.0</p> <p>Level 3 or above in a KINE or PHED plan.</p> <p><b>Exclusion:</b></p>								
<p><b>Course Description:</b></p> <p>The focus of this course is to develop an advanced understanding of cardiovascular and respiratory responses in meeting oxygen demand of exercising skeletal muscle. Topics addressed include: how oxygen delivery impacts exercising skeletal muscle metabolism and contraction; compromised exercise performance in selected diseases (e.g. one of chronic obstructive pulmonary disease, heart failure etc...); mechanisms of pharmacological and non-pharmacological enhancement of exercise tolerance/performance.</p>		<p><b>Course Texts:</b></p> <p>There is no assigned textbook for this course.</p> <p><b>Course Notes:</b></p> <p>Course material will be available on the course onQ site.</p>								
<p><b>Intended Student Learning Outcomes</b></p> <p>At the conclusion of this course students should be able to: (Do What, With/To What, For What Purpose)</p> <ul style="list-style-type: none"> <li>• <b>Explain and Illustrate:</b> <ul style="list-style-type: none"> <li>○ <u>Cardiovascular and respiratory responses to exercise, and their mechanisms</u> <ul style="list-style-type: none"> <li>▪ <b>to inform</b> <ul style="list-style-type: none"> <li>• expertise in integrative cardiovascular and respiratory exercise physiology.</li> </ul> </li> </ul> </li> </ul> </li> <li>• <b>Create and Apply:</b> <ul style="list-style-type: none"> <li>○ <u>Key principle, cause-effect and physiological models</u> <ul style="list-style-type: none"> <li>▪ <b>to predict and interpret</b> <ul style="list-style-type: none"> <li>• cardiovascular and respiratory support of exercising muscle and the mechanisms responsible.</li> </ul> </li> </ul> </li> </ul> </li> <li>• <b>Evaluate, Interpret and Communicate:</b></li> </ul>		<p><b>Course Evaluation:</b></p> <table border="0"> <tr> <td>Tutorial Preparation Task (11)</td> <td style="text-align: right;">14%</td> </tr> <tr> <td>Assignment – Response Prediction (4)</td> <td style="text-align: right;">30%</td> </tr> <tr> <td>Assignment – Original Research Presentation (2)</td> <td style="text-align: right;">30%</td> </tr> <tr> <td>Final Exam</td> <td style="text-align: right;">26%</td> </tr> </table>	Tutorial Preparation Task (11)	14%	Assignment – Response Prediction (4)	30%	Assignment – Original Research Presentation (2)	30%	Final Exam	26%
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- Scientific literature
  - **to facilitate evidence-based understanding of**
    - advances in cardiovascular and respiratory exercise physiology related to oxygen delivery:demand matching.

**Course Outline**

Introducing oxygen delivery, demand matching and sensitivity of exercise tolerance/performance to muscle oxygenation	Pulmonary determination of oxygen delivery at the muscle
Local determination of oxygen delivery at the muscle	Dietary nitrate: ergogenic enhancement of oxygen delivery at the muscle.
Cardiac determination of oxygen delivery at the muscle	Pathological dysfunction of oxygen delivery to exercising muscle: COPD

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