

PERS10060

Introduction to Exercise Science

Assignment: Essay on Key Topic in Exercise Science

(50% of module grade)

The focus of this assignment will be on producing a succinct and coherent discussion of a **key topic in exercise science**.

The word count limit is **1300 words**. The assignment will contribute 50% to your overall module grade.

Submitting your assignment

The assignment must be submitted by 5pm (GMT) on Friday Week 13, 30th April. This assignment must be uploaded in BrightSpace as a word document under the 'Assignment' tab.

Topic

Choose one of the following topics. You may write it as an essay or answer each sub-part separately.

Topic 1: Describe the metabolic response to acute exercise as a function of exercise intensity and duration.

In your answer,

- (i) Explain what is ATP. What is its relevance to exercise and muscle contraction?
- (ii) Name and describe the different fuel systems that contribute to ATP regeneration during exercise.
- (iii) Explain what is meant by the terms "relative power" and "capacity" in terms of ATP supply from various metabolic pathways.
- (iv) Describe what changes occur in the relative contributions of carbohydrate and fats to energy provision with increasing intensity. What changes occur with increasing exercise duration?
- (v) Discuss the relevance of the energy systems to and the primary factors likely to contribute to fatigue in a 60m sprint, a 400m all-out run, and a marathon.

OR

Topic 2: Describe the respiratory response to acute exercise

In your answer,

- (i) Describe two major functions of the respiratory system
- (ii) Briefly describe what drives oxygen transfer from atmospheric air to the mitochondria.
- (iii) Discuss what are the four potentially limiting factors for VO_{2max} , for a healthy human being performing maximal, whole-body exercise? Which is thought to be the major limiting factor for VO_{2max} ?

- (iv) Briefly discuss whether or not VO_{2max} is a good predictor of endurance performance.
- (v) Discuss how you could use lactate or respiratory data collected during an exercise test for exercise prescription for an athlete.

Plagiarism and Referencing

Note: All assignments will be run through plagiarism software. Details on UCD's plagiarism policy can be found here <https://www.ucd.ie/governance/resources/policypage-plagiarismpolicy/>. You are required to have a reference list at the end of the assignment. Not all points will need to a reference but if you are drawing on external literature to support your answer, please provide a reference for this. References should be formatted according to the Harvard reference style <https://libguides.ucd.ie/harvardstyle>.

Recommended Resources

Each of the articles below are available in pdf form in BrightSpace

1. PERS10060 Lecture 3 Notes. Acute metabolic responses to exercise
2. PERS10060 Lecture 7 Notes. Acute respiratory responses to exercise
3. Bassett & Howley (2000). Limiting factors for maximum oxygen uptake and determinants of endurance performance. *Med Sci sports Exerc* 32(1): 70-84. Week 7 recommended reading.

Format for submitting as a Word document

- Use only Arial or Calibri fonts, size 11 point in size.
- Use standard 1 inch (2.54cm) margins for the top, bottom, left, and right.
- All assignments should be 1.5 line spaced.

Your student number and module code should be included in a header on each page of the assignment.