

Liverpool John Moores University

Title: EXERCISE METABOLISM
Status: Definitive
Code: **7143SPOSCI** (124261)
Version Start Date: 01-08-2021

Owning School/Faculty: Sport and Exercise Sciences
Teaching School/Faculty: Sport and Exercise Sciences

Team	Leader
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Academic Level: FHEQ7 **Credit Value:** 20 **Total Delivered Hours:** 74
Total Learning Hours: 200 **Private Study:** 126

Delivery Options

Course typically offered: Semester 2

Component	Contact Hours
Lecture	24
Practical	48

Grading Basis: 50 %

Assessment Details

Category	Short Description	Description	Weighting (%)	Exam Duration
Report	Lab report	Students will complete a lab practical and then submit a written report on this (Intro, methods, results, discussion etc).	50	
Exam	Exam	2 hour examination where students will have to answer 'short answers' and 1 essay style question	50	2

Aims

This module aims to increase students' understanding of the regulation of the metabolic processes by which energy is stored and metabolised during subsequent exercise as well as examining the molecular mechanisms underpinning muscle adaptation to training and disuse. Specific attention will be placed upon the effects of nutrition on modulating the above processes. Additionally, students will be introduced to a range of physiological tests and laboratory techniques that sports scientists may use to assist with nutritional interventions for elite athletes and interpret research papers, respectively.

Learning Outcomes

After completing the module the student should be able to:

- 1 Critically evaluate the regulatory steps in the metabolic pathways of carbohydrate, lipid and amino acid metabolism
- 2 Critically evaluate the regulatory mechanisms underpinning energy production during endurance and high-intensity exercise and the influence of training and nutritional status on modulating these responses
- 3 Critically evaluate the molecular mechanisms underpinning muscle adaptation to endurance and resistance exercise training

Learning Outcomes of Assessments

The assessment item list is assessed via the learning outcomes listed:

Laboratory practical & report	1		
Short answer exam	1	2	3

Outline Syllabus

Week 1 Overview of Exercise Metabolism

Week 2 Carbohydrate Metabolism

Week 3 Lipid Metabolism

Week 4 Amino Acid Metabolism

Week 5 Nutrient Effects on Exercise Metabolism

Week 6 Training Effects on Exercise Metabolism

Week 7 Endurance Exercise Metabolism

Week 8 High-Intensity Exercise Metabolism

Week 9 Molecular Exercise Metabolism

Week 10 Molecular Mechanisms of Endurance Training Adaptation

Week 11 Molecular Mechanisms of Strength Training Adaptation

Week 12 Molecular Mechanisms of Concurrent Training Adaptation

Learning Activities

This module will use a combination of formal lectures and class practicals to fully engage the students in their own learning. Concepts discussed in lectures will then be explored in the laboratory and this will be reflected in the assessment which will be in the form of a written laboratory report.

Notes

This module aims to increase the students understanding of the regulation of the metabolic processes by which muscles are provided with energy during exercise as well as examining the molecular mechanisms underpinning muscle adaptation to training. Prior to intervention with nutritional strategies, it is essential to understand how muscle metabolises and stores fuel. Special attention will be given to carbohydrate and fat metabolism and the influence of exercise intensity, duration, training status and nutrient availability on the regulation of energy metabolism will also be studied. Students will also undertake a series of laboratory practicals that are considered essential to the field of exercise physiology and metabolism e.g. VO₂max, lactate threshold, FatMAX, indirect calorimetry etc