

Liverpool John Moores University

Title: EXERCISE METABOLISM
Status: Definitive
Code: **7043SPOSCI** (120338)
Version Start Date: 01-08-2014

Owning School/Faculty: Sports Sciences
Teaching School/Faculty: Sports Sciences

Team	Leader
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Academic Level: FHEQ7 **Credit Value:** 20.00 **Total Delivered Hours:** 25.00

Total Learning Hours: 200 **Private Study:** 175

Delivery Options

Course typically offered: Semester 2

Component	Contact Hours
Lecture	18.000
Practical	6.000

Grading Basis: 40 %

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).	50.0	
Exam	Exam	In class test over 1 hour where students will have to answer 'short answers'	50.0	1.00

Aims

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, disuse and metabolic disease.

Learning Outcomes

After completing the module the student should be able to:

- LO1 Critically evaluate the regulatory steps in the metabolic pathways of carbohydrate, lipid and amino acid metabolism
- LO2 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
- LO3 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	LO 1	LO 2	LO 3
Short answer exam	LO 1	LO 2	LO 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 Causes of Fatigue*
- Week 10 Molecular Exercise Metabolism*
- Week 11 Molecular Mechanisms of Endurance Training Adaptation*
- Week 12 Molecular Mechanisms of Strength Training Adaptation*

Learning Activities

This module will use a combination of formal lectures, class practicals and small group seminars 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.

References

Course Material	Book
Author	Don MacLaren and James Morton
Publishing Year	2011
Title	Biochemistry for Sport and Exercise Metabolism
Subtitle	
Edition	1st
Publisher	Wiley
ISBN	978-0-470-09184-5

Course Material	Book
Author	Tiidus, Tupling and Houston
Publishing Year	2012
Title	Biochemistry Primer for Exercise Science
Subtitle	
Edition	4th
Publisher	Human Kinetics
ISBN	978-0-736-09605-8

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