

## Liverpool John Moores University

Title: Biochemistry and Metabolism  
Status: Definitive  
Code: **4004SPS** (129007)  
Version Start Date: 01-08-2021

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

Team	Leader
Ian Davies	Y
Abdulmannan Fadel	
Juliette Strauss	
Matthew Cocks	
Sam Shepherd	
James Morton	

**Academic Level:** FHEQ4      **Credit Value:** 20      **Total Delivered Hours:** 41

**Total Learning Hours:** 200      **Private Study:** 159

### Delivery Options

Course typically offered: Semester 2

Component	Contact Hours
Lecture	12
Practical	16
Workshop	12

**Grading Basis:** 40 %

### Assessment Details

Category	Short Description	Description	Weighting (%)	Exam Duration
Report	AS1	Written Lab Report (2,500 words)	60	
Exam	AS2	MCQ Exam (1 hours)	40	1

### Aims

*This module builds upon the broader systems level module (4105SPOSCI) to consider physiology and metabolism at the molecular level. The module aims to take the student through a journey from consumption of food, and the biochemical/metabolic processes that are necessary to generate energy and synthesise tissue, through to how the body systems deal with waste. It explores how dysregulation of biochemical/metabolic pathways can lead to disease states and how optimisation of nutrition can reduce risk of disease and enhance exercise performance.*

## **Learning Outcomes**

After completing the module the student should be able to:

- 1 Define the underlying concepts and principles of biochemistry and metabolism (from initial food intake, digestion, absorption, transport, metabolism and finally excretion).
- 2 Identify the role of biochemistry and metabolism in health and disease.
- 3 Analyse and interpret biochemical/metabolic data in order to develop lines of argument and make sound judgements in accordance with nutrition and exercise theories.

## **Learning Outcomes of Assessments**

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

Lab Report (2500 words)	1	3
MCQ	1	2

## **Outline Syllabus**

*Digestion and absorption and its regulation:*

*Salivary glands; Stomach; Small intestine; Large intestine; Hormonal/neural; regulation.*

*Energy metabolism:*

*Glycolysis, glycogenolysis; Lipid transport (carnitine shuttle); Beta-oxidation; TCA (Kreb's cycle); Electron transport chain; Gluconeogenesis; Cori cycle; Fatty acid synthesis, cholesterol synthesis.*

*Protein metabolism:*

*Protein catabolism (excretion of waste); Protein anabolism (muscle protein synthesis).*

*Non communicable diseases related to nutrition:*

*Cancers; CVD; Diabetes.*

## **Learning Activities**

Lectures, workshops/seminars, and practical sessions will be the main form of student learning activities. The use of Canvas using online laboratory skill software (to aid live practical classes) and quizzes will provide a blended learning approach. Students will work collaboratively on problem solving (e.g. laboratory and workshop sessions) with early formative and summative feedback.

## Notes

The Association for Nutrition (AfN) competencies covered in this module include:

CC1a The human/ animal body and its functions, especially digestion, absorption, excretion, respiration, fluid and electrolyte balance, cardiovascular, neuro-endocrine, musculoskeletal and haematological systems, immunity and thermoregulation, energy balance and physical activity.

CC1b Mechanisms for the integration of metabolism, at molecular, cellular and whole-body levels for either human or animal systems.

CC1d Nature and extent of metabolic demand for nutrients.

CC1i Nutrition in health and disease, consequences of an unbalanced diet for either human or animal systems.

CC1j Nature of common conditions that require dietary manipulation or can affect physical activity, such as obesity, diabetes, hypertension, cardiovascular disease, cancer etc. for either human or animal systems.

CC1m Ability to carry out sample selection and to ensure validity, accuracy, calibration, precision, replicability and highlight uncertainty during collection in accordance with the basic principles of good clinical practice.

CC1n Ability to obtain, record, collate, analyse, interpret and report nutrition-related data using appropriate qualitative and quantitative research and statistical methods in the field and/or laboratory and/or intervention studies, working individually or in a group, as is most appropriate for the discipline under study.

CC1o Prepare, process, interpret and present data, using appropriate qualitative and quantitative techniques, statistical programmes, spreadsheets and programs for presenting data visually.