

## Liverpool John Moores University

Title: PHYSIOLOGY AND TOXICOLOGY  
Status: Definitive  
Code: **7111PHASCI** (124935)  
Version Start Date: 01-08-2021

Owning School/Faculty: Pharmacy & Biomolecular Sciences  
Teaching School/Faculty: Pharmacy & Biomolecular Sciences

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**Academic Level:** FHEQ7      **Credit Value:** 20      **Total Delivered Hours:** 40  
**Total Learning Hours:** 200      **Private Study:** 160

### Delivery Options

Course typically offered: Semester 1

Component	Contact Hours
Lecture	23
Practical	9
Workshop	6

**Grading Basis:** 50 %

### Assessment Details

Category	Short Description	Description	Weighting (%)	Exam Duration
Presentation	Poster	Group poster, based on a "product", comprising several ingredients. Students will research ingredients separately prior to producing a group poster.	50	

Category	Short Description	Description	Weighting (%)	Exam Duration
Exam	Exam	Exam: Three from five long answer questions covering relevant physiology and toxicology	50	2

## Aims

*To enable students to describe key physiological processes and how these may be perturbed by exogenous chemicals to elicit a toxicological response.*

## Learning Outcomes

After completing the module the student should be able to:

- 1 Describe key physiological processes and how these may be perturbed by interaction with toxicants.
- 2 Explain key mechanisms of toxicity and how these relate to diverse toxicological responses in organ systems of interest.
- 3 Locate, interpret and evaluate in vivo, in vitro and in chemico data.
- 4 Synthesise and present information from a range of resources, relating to the measured internal/external exposure and toxicity of chemicals of interest.

## Learning Outcomes of Assessments

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

Data analysis	3	4
Examination	1	2

## Outline Syllabus

*Anatomy and physiology of relevant organ systems, e.g. those involved as routes of entry/application, uptake, metabolism and elimination of chemicals (skin, gastrointestinal tract, lungs, eyes, nails, lips, hair).*

*Key mechanisms of toxicity resulting from the interaction of chemicals with biological systems e.g. inflammation, irritation, immune response, skin sensitisation, protein/DNA binding, mitochondrial toxicity. Skin sensitisation and liver toxicity as exemplars of adverse outcome pathways and the role of molecular initiating events (MIEs), with reference to additional toxicities associated with these MIEs that are also relevant to safety assessment of chemicals (carcinogenicity, mutagenicity, developmental and reproductive toxicity).*

*The role of in vitro, in vivo and in chemico assays in safety assessment.*

## Learning Activities

Flipped and/or traditional lectures to introduce /cover the topics outlined in the syllabus.

Workshops to assist students in locating, evaluating and interpreting in vivo, in vitro and in chemico data. The workshops will be focused on fulfilling the requirements of the coursework exercise.

Practical activity will typically relate to assessing potential exposure, measuring toxicity and investigating chemical potential to ameliorate toxicity (e.g. in vivo investigation of dermal exposure and interaction with skin, in vitro toxicity (MTT) assay, determination of anti-oxidant activity.)

## **Notes**

Students will learn key physiological processes along with the toxicological responses that may be elicited by any chemicals to which humans are exposed. Coursework exercises will be tailored to give greater emphasis to particular chemical types of relevance to the different cohorts (e.g. cosmetic ingredients for M Sc Cosmetic Science students; general industrial chemicals, intermediates and/or impurities for M Sc Computational Toxicology students).