Computational Toxicology

Programme Information

2022.01, Approved

Overview

Programme Code	36013
Programme Title	Computational Toxicology
Awarding Institution	Liverpool John Moores University
Programme Type	Masters

Awards

Award Type	Award Description	Award Learning Outcomes
Target Award	Master of Science - MS	N/A
Alternative Exit	Postgraduate Diploma - PD	Engage with advanced levels of theories and practice in relation to the field of Computational Toxicology. Identify and apply appropriate research methodologies. Take an informed position in relation to the field of Computational Toxicology. Demonstrate skills in critical analysis, reflection and contextual awareness in a wide range of modules associated with the field of study.

Alternate Award Names	

External Benchmarks

Subject Benchmark Statement	

Programme Offering(s)

Mode of Study, Mode of Delivery	Intake Month	Teaching Institution	Programme Length Programme Length Unit
Part-Time, Face to Face	September	LJMU Taught	1 Years

Aims and Outcomes

Educational Aims of the Programme	The overall aim of the programme is to equip students with an understanding of, and practical experience in, the use of computational methods to predict the toxicity of chemicals as alternatives to animal testing. Specific aims: 1. To provide students with a knowledge of current computational approaches to predict toxicity, from both a theoretical and a practical perspective. 2. To enable students to extend their capacity for independent study and collaborative teamwork. 3. To provide students with the opportunity to improve their oral and written communication skills. 4. To empower students to plan, complete and report an independent research project.

Learning Outcomes

Code	Number	Description
PLO1	1	Explain how chemicals may interact with biological systems to perturb normal physiological functions and elicit a toxicological response.
PLO2	2	Demonstrate a thorough knowledge and understanding of the application of computational methods (in the context of good modelling practice) to investigate and predict toxicological responses and the role of such methods in reducing animal testing.
PLO3	3	Demonstrate competence in the use of a wide range of software and approaches relevant to predictive toxicology.
PLO4	4	Demonstrate awareness of the regulatory tests, strategies and approaches to assess chemical safety in the UK, EU and worldwide.
PLO5	5	Locate, critically evaluate, synthesise and make appropriate use of information from scientific literature and relevant electronic resources.
PLO6	6	Communicate scientific information clearly, orally and in writing, at a level appropriate to different audiences.
PLO7	7	Demonstrate proficiency in planning a high level research project, considering all relevant aspects.
PLO8	8	Demonstrate proficiency in conducting and reporting an independent research project and effectively communicating the results of research orally and in writing.

Course Structure

Programme Structure Description	To obtain an MSc. in Computational Toxicology, students must acquire 180 L7 credits. Intermediate awards are Postgraduate Certificate (any taught modules comprising a total of 60 L7 credits) and Postgraduate Diploma (all taught modules comprising a total of 120 L7 credits without completing the dissertation).

Programme Structure - 180 credit points	
Level 7 - 180 credit points	
Level 7 Core - 180 credit points	CORE
[MODULE] 7101PHASCI Research Methods Approved 2022.01 - 20 credit points	
[MODULE] 7108PHASCI Research Project Approved 2022.01 - 60 credit points	
[MODULE] 7111PHASCI Physiology and Toxicology Approved 2022.01 - 20 credit points	
[MODULE] 7114PHASCI Safety-Based Decision Making Approved 2022.01 - 20 credit points	
[MODULE] 7116PHASCI Computational Approaches at the Chemical-Biological Interface Approved 2022.01 - 20 credit points	
[MODULE] 7117PHASCI Computational Methods in Toxicology I: Data and Modelling Approved 2022.01 - 20 credit points	
[MODULE] 7118PHASCI Computational Methods in Toxicology II: Advanced Predictive Methods Approved 2022.01 - 20 credit points	
Level 7 Optional - No credit points	OPTIONAL

Teaching, Learning and Assessment

Teaching, Learning and Assessment	A variety of teaching methods will be employed such as, flipped/traditional lectures, workshops, seminars, tutorials and practical classes in traditional laboratory and computational suites. Sessions may incorporate elements from more than one type of activity e.g. “hybrid” sessions combining, lecture, workshop and (computational) practical activity. Workshops will be used to support both formal teaching activities and coursework exercises with a number of workshops typically being associated with each coursework exercise. Assessment will use a range of methods to accommodate individual student preferences. The format of 50% coursework : 50% exam will be used for all modules, except research methods and project modules which are assessed entirely on coursework. The coursework assessment types will include: an essay; narrated slides; a concise writing exercise; a research proposal; a podcast; information/evidence summary sheets; a poster; a report produced within a group; data and evaluation summaries; a Quantitative Structure-Activity Relationship (QSAR) model report (and an associated QSAR model); an Integrated Approach to Testing and Assessment (IATA) report; an oral presentation as part of a group; an individual oral presentation and defence and a 12,000-15,000 word dissertation.

Opportunities for work related learning

Opportunities for work related learning
The programme offers a specific period of work related learning in the Research Project module (7108PHASCI). Students may be offered a research project in computational toxicology or an area related to this. All project work offers individuals the opportunity to develop their critical reasoning and complex problem solving skills. The projects will require students to demonstrate professional skills in planning, organisation, time-management, using initiative, data analysis and reporting, whilst working independently. These generic skills are essential to future employment in a professional role. Throughout the programme learning activities are focused on developing detailed subject-specific knowledge, alongside a significant level of practical experience in the use of relevant software and approaches. This will ensure students are well prepared to secure future employment in many areas associated with field of computational toxicology.

Entry Requirements

Type	Description
Alternative qualifications considered	An undergraduate degree (2ii or above) in Chemistry, Pharmaceutical Science, Biomedical Science, Medicinal Chemistry, or a related science discipline such as Pharmacy, Biochemistry, Biology, Pharmacology or Toxicology.
Other international requirements	International students require an IELTS score of 6.5. This must include a minimum of 6 in each component.

Programme Contacts

Programme Leader

Contact Name
Judith Madden

Link Tutor

Contact Name