E-LEARNING COURSE: BEGINNER'S GUIDE TO TOXICOLOGY

Chemical Watch presents its engaging eLearning course: The Beginner’s Guide to Toxicology - 18 information-packed modules that give you a solid introduction to and understanding of Toxicology, with reference to the REACH regulatory framework.

An easy-to-use, convenient course
The Beginner’s Guide to Toxicology is an easy-to-use online course that you can pick up and put down to fit around your busy schedule - a course that runs in a web browser (on PC or Mac), on your tablet or even a smartphone - even remembering your progress so you can dive straight back in where you left off on your next session.

Measurable outcomes
Each module features a short series of quiz questions designed to measure whether or not you’ve met the learning objectives for that section of the course, giving instant feedback on your progress.

Engaging
With over 580 professionally-designed slides, 350 audio explanations, 120 quiz interactions, nearly 100 videos and 18 course note handouts, you’re sure to find this course not only interesting but highly engaging, throughout.

Affordable learning
Low per-trainee prices, attractive group rates and reduced costs (no time out of the office or travel required) ensure you maximise returns on your training budget.

Learning Outcomes - You will be able to:

Module 1: Introduction to Toxicology
- Define the term toxicology
- Describe the different ways in which chemicals can cause harm
- Explain the impact that physical forms can have on toxicity and exposure

Module 2: How to assess for toxicity
- Define the terms In vitro, ex vivo, in vivo
- Explain what is meant by the term “alternative methods” and how the 3R’s form part of these
- Outline the sections of the REACH Regulation which encourage the use of alternatives
- Describe what other non-animal alternatives are available for finding test data
- Explain what is meant by in vivo studies and two of the main issues regarding their use

Module 3: Risk, hazard and exposure
- Define the terms risk, hazard and exposure
- Describe the three main routes of exposure and the significance to toxicity

Module 4: Dose response effects
- Define the term dose and response
- Draw a “typical” dose response curve and describe the key parts
- Explain what is meant by the term “threshold”
- Explain the difference between thresholded and non-thresholded effects with examples
- Define the terms NOAEL and LOAEL

Module 5: Irritation and corrosion
- Define the terms Local effect, irritant and corrosive
- Explain what is meant by irritant contact dermatitis and how it typically occurs

Module 6: Toxicokinetics
- Define the term toxicokinetics
- Explain what happens at each of the respective stages; absorption, distribution, metabolism and excretion
- Outline the REACH requirements in relation to toxicokinetics

Module 7: Acute toxicity
- Define the term acute toxicity and explain how it differs to repeated dose toxicity
- Explain why it is not possible to use acute toxicity data to predict repeated dose effects
- Describe the common testing strategies that can be used to assess acute toxicity
- Outline the REACH requirements in relation to this endpoint

Module 8: Repeated dose toxicity (target organ effects)
- Define the term “systemic effect” and target organ effect with examples
- Explain the different types of repeated dose studies and the basic differences between these
- Describe the common testing strategies that are used for repeated dose toxicity
- Outline the REACH requirements in relation to this endpoint
### Module 9 - Carcinogens
- Define the terms Carcinogenicity, Benign and malignant tumours, Genotoxic and non genotoxic carcinogens
- Outline the steps in carcinogenesis
- Describe the common causes of cancer
- Describe the common testing strategies for detecting chemical carcinogens
- Outline the REACH requirements in relation to this endpoint

### Module 10 - Genetic toxicology
- Explain the differences between DNA, genes and chromosomes
- Define the terms mutagenicity and genotoxicity
- Describe the types of effects that can occur (on genes, chromosomes and DNA itself) as a result of chemical exposure
- Explain the significance of genetic toxicology and its relationship with carcinogenesis
- Describe the common testing approach and methods that are used for genetic toxicology
- Outline the REACH requirements in relation to this endpoint

### Module 11 - Reproductive and developmental effects
- Define the terms reproductive toxicology and developmental effects
- Give examples of common adverse effects that are typical of reproductive or developmental toxins
- Outline the common testing strategies that are used to investigate such effects
- Outline the REACH requirements in relation to this endpoint

### Module 12 - Chemical allergies
- Describe how an allergy develops
- Define the term allergic contact dermatitis
- Explain the difference between allergic contact dermatitis and irritant contact dermatitis
- Define the terms respiratory hypersensitivity, occupational asthma and work related asthma
- Explain the significance of developing an allergy to a chemical in the workplace
- Outline the common testing methods used to detect respiratory and skin sensitisers
- Outline the REACH requirements in relation to this endpoint

### Module 13a - EMERGING CONCEPTS - AOP
- Define the term adverse outcome pathways (AOP)
- Identify the three main pieces of information which is required to develop an AOP
- Explain the usefulness of AOP in toxicology
- Identify two current issues related to the use of AOP

### Module 13b - EMERGING CONCEPTS - Combined effects
- Explain the current issues related to toxicity testing for mixtures
- Describe what is meant by the terms additive, synergistic, antagonistic and potentiation
- Outline the approaches currently taken in Europe when considering combined effects

### Module 13c - EMERGING CONCEPTS - Endocrine disruptors
- Describe what is meant by the endocrine system and its function within living organisms
- Explain the term "endocrine disruptor" and "endocrine active" substances
- Describe what is meant by "low dose effects" and "non monotonic dose response"
- Explain how endocrine disruptors are dealt with under the Reach Regulation
- Outline the key issues related to the assessment of endocrine disruptors

### Module 13d - EMERGING CONCEPTS - Nanoparticles
- Define the term "nanoparticle"
- Give two examples of nanomaterials
- Outline the current key issues related to nanoparticles
- Explain how nanoparticles are dealt with under REACH

### Module 14 - Toxicology & REACH
- Define the term DNEL and explain the different types which may be derived
- Outline the process for deriving a DNEL
- Explain what is meant by risk characterisation and the difference between quantitative and qualitative risk characterisation
- Explain the different approaches that can be taken with regards to exposure modelling and the difference between a Tier 1 and Tier 2 model
- Define the term risk characterisation ratio and its significance
- Describe the difference between the extended safety data sheet and a safety data sheet and when these documents need to be made available
- Describe the changes which the introduction of the CLP Regulation has had on the duties of suppliers within Europe
- Define the term "CMR" and "PBT" and the implications under REACH

### Module 15 - Toxicological Testing Requirements and REACH
- Describe the underlying principle behind REACH in the context of human health
- Describe where the human health endpoints are listed in the REACH Regulation and explain why as the tonnage being placed on the market increases so does the testing requirements
- Explain what is meant by standard information requirements and where these can be located within the REACH REGULATION
- Explain the kind of information that can be derived from Column 2 to the standard information requirements
- Explain what kind of information can be obtained from Annex XI
- Define the terms "Adaptation", "Data Waiver", "weight of evidence", "exposure based waiving" AND "read across"