eLearning Course

Beginner's Guide to Toxicology (Version 2.0)

17 information-packed modules that give you a solid introduction to toxicology

Understanding the potential hazards and risks of using chemicals in both daily and work life is a key component to keeping yourself and others around you safe.

In this newly updated eLearning course, you'll be given a solid introduction to how chemicals can cause harm to humans, and how to prevent this, by accomplished toxicologist and trainer Laura Robinson.

Chemical Watch

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 schedule, available trough your web browser (on PC or Mac), your tablet, or your smartphone. The course will also remember progress so you can dive straight back in where you left off on your next session.

Engaging

With over 500 professionally-designed slides, 295 audio explanations, 90 videos, quizzes and supplementary handouts to aid your learning experience, you're sure to find this course not only interesting but highly engaging, throughout.

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.

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
- 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 terms '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
- Explain the common testing methods that are used to detect chemical corrosives and irritants

MODULE 6

Toxicokinetics

- Define the term 'toxicokinetics'
- Explain what happens at each of the respective stages; absorption, distribution, metabolism and excretion

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

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

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

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

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

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

MODULE 13A

Emerging concepts - AOP

- Define the term 'adverse outcome pathways' (AOP)
- Identify the three main pieces of information which are 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'

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'
- Outline the key issues related to the assessment of endocrine disruptors

MODULE 13D

Emerging concepts - Nanoparticles

- Explain what is meant by the term 'nanoparticle'
- Give two examples of nanomaterials
- Outline the current key issues related to nanoparticles

MODULE 14

Toxicology & human health risk assessment

- Explain what is meant by the term 'risk assessment'
- Outline the main stages of risk assessment
- Define the term 'DNEL' and explain how it is used
- Explain what is meant by safety factors/ uncertainty factors and assessment factors, and how these are used
- Describe the two approaches which can be used for exposure assessment
- Explain what is meant by risk characterisation and how it is used

Our trainees

The first edition of The Beginner's Guide to Toxicology, helped over 900 professionals gain confidence in understanding the adverse effects of chemicals on humans. Our trainees included professionals from the following organisations:

£400

Essential members get 15% and advanced members get 20% discount

please give us a call on: +44 (0)1743 818292 or email cw.sales@chemicalwatch.com

Find out more: www.chemicalwatch.com/toxicology-elearning