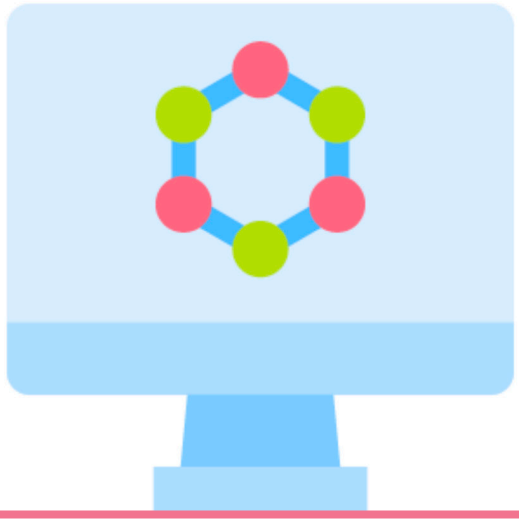
CHEMICALS & WASTE
MANAGEMENT PROGRAM

unitar
United Nations Institute for Training and Research

NANOMATERIALS SAFETY

e-Learning course

Learn about the sound management of manufactured nanomaterials, from their application to potential risks.



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Office fédéral de l'environnement OFEV
Ufficio federale dell'ambiente UFAM
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CONTENT

BACKGROUND

The e-Learning course "Nanomaterials Safety" provides interested stakeholders an introduction to the sound management of manufactured nanomaterials. Nanomaterials have a range of novel properties enabling many new, useful applications in areas such as medicine, environment, energy production and material technology.

However, the special properties of nanomaterials can also be a challenge, as these materials may have different implications for human health or the environment compared to traditional chemicals.

The course has been developed by UNITAR, based on work under the Strategic Approach to International Chemicals Management (SAICM) and by other international organizations, such as the Organisation for Economic Cooperation and Development (OECD).

TARGET GROUP

The e-learning courses is intented for large range of stakeholders:

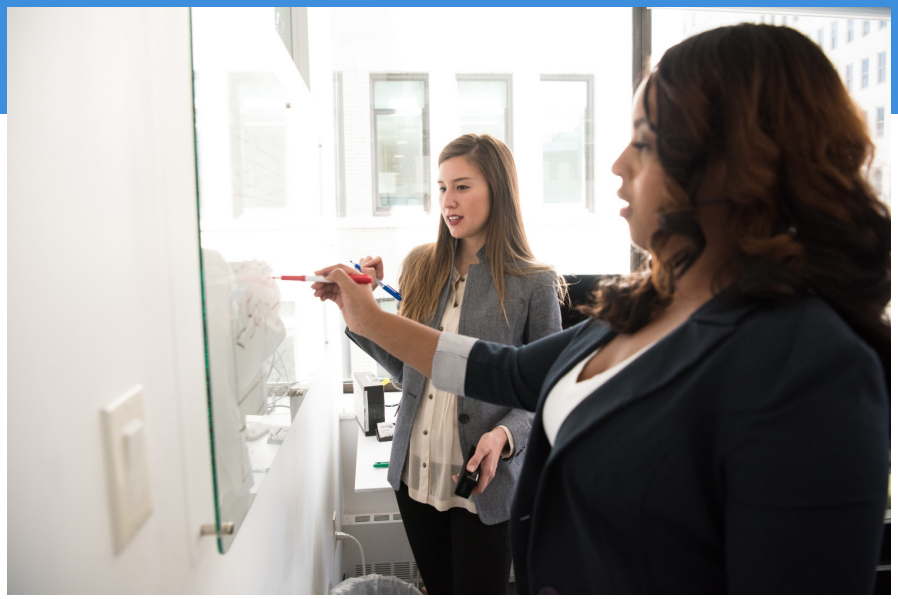
- civil servants in national ministries;
- provincial departments and local authorities;
- environmental and occupational safety practitioners in private sector and civil society organizations;
- industry workers or representatives involved in production of nanomaterials;
- faculty members, researchers and students;
- interested citizens.

GENERAL LEARNING OBJECTIVES

Participants will learn about global, national and sector-specific issues, and begin to develop skills for recognising safety concerns and learning about risk management.

After completing the course, participants will be able to:

- Discuss properties, uses, and safety issues of nano-containing products ;
- Classify hazard, exposure and risk assessments, and options;
- Identify opportunities and challenges to regulate nanomaterials;
- Discuss international and national regulatory approaches;
- Differentiate applications and uses of nanomaterials to improve environmental, health, and safety issues.



COURSE STRUCTURE

Module 1 - Introduction to Manufactured Nanomaterials

Learning objectives

- *Introduce and define nanomaterials;*
- *Describe the most common nanomaterials, their properties and uses;*
- *Describe research programmes on the safety of nanomaterials in a selection of countries;*
- *Measurement techniques: describe the challenge of complex matrices and categorization;*
- *Measurement techniques: describe the most important analytical techniques for the quantification of nanomaterials;*
- *Describe the main international testing initiative to evaluate risks of manufactured nanomaterials.*

Content

1. Definition, properties of nanomaterials, use and commerce;
2. Research programs on nanosafety;
3. Methods for quantification of nanomaterials in food and consumer goods;
4. OECD test guidelines for manufactured nanomaterials.

Module 2 - Hazard assessment, safety and risks of manufactured nanomaterials

Learning objectives

- *Describe hazards of nanomaterials to people and the environment;*
- *Describe methods used to characterize exposures to nanomaterials in the workplace and related occupational exposure limits;*
- *Provide an overview of the chemical safety assessment process;*
- *Understand the principles of risk assessment in consumer goods;*
- *Understand the principles of environmental risk assessment;*
- *Understand the ECHA Guidance on Information Requirements and Chemical Safety Assessment.*

Content

1. Hazard assessment of manufactured nanomaterials
2. Workplace safety: Occupational exposure health assessment
3. Consumer safety: Risk assessment in consumer goods
4. Environmental risk assessment

Module 3 - Risk management of manufactured nanomaterials, including societal dimensions - global approaches

Learning objectives

- *Know that SAICM recognized the safety of nanoparticles as an emerging policy issue;*
- *Have an overview of the process for the sound management of chemicals and waste beyond 2020;*
- *Understand the scope of the Basel Convention and to know the discussion about nano waste in the last Conferences of the Parties (COP) and Open-ended Working Group (OEWG);*
- *Learn about the World Health Organization guidelines on protecting workers from potential risks of manufactured nanomaterials;*
- *Learn what the World Health Organization states about hazards of nanomaterials, specific exposure measurement techniques and risk mitigation measures for protecting workers from nanomaterials in the workplace;*
- *Review applicability of Safety Data Sheets and GHS hazard classification to nanomaterials;*
- *Learn about socio-economic analysis; SEA:*
- *Understand the possible dangers of a "nano-divide";*
- *Know the Principle 15 of the Rio Declaration on Environment and Development.*

Content

1. Nanosafety as an emerging policy issue (EPI) of SAICM;
2. WHO guidelines on protecting workers from potential risks of manufactured nanomaterials;
3. Materials Safety Data Sheet MSDS; Applicability of the GHS classification criteria to nanomaterials;
4. Sound management of nanomaterials at the end of the life cycle and in waste streams (including Basel Convention);
5. Societal dimensions (economic and social impacts, ethical issues, public dialogue, learning, training, capacity building).

METHODOLOGY, RESOURCES AND CERTIFICATION

The course, which contains about 3 hours of content, is self-paced and adapted to the schedule of full-time working professionals. We advise short or medium sessions from 10 to 60 minutes per day, depending on the section studied. Participants are provided with the opportunity to learn through various experiences: absorb (read) and interact (activity). This includes reading materials and quizzes.

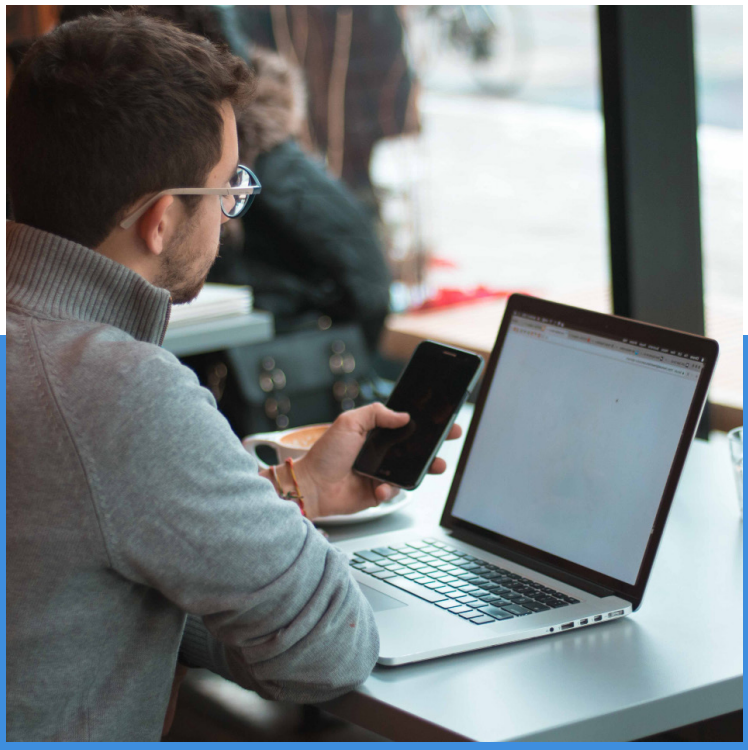
All sections conclude with a quiz assessing the knowledge learners will acquire (each quiz requires a score of 80% to pass).

A certificate of completion will be awarded to all participants who have successfully completed all 3 modules of the course.

Additionnally, participants will be requested to provide feedback on the course by filling in a feedback form after completing all the modules, accessible anytime.

TECHNICAL REQUIREMENTS

The course can be completed on a computer (Windows and Mac) or a mobile device (Ipad or Android tablet). Any internet browser is compatible as long as it has been updated to its latest version.



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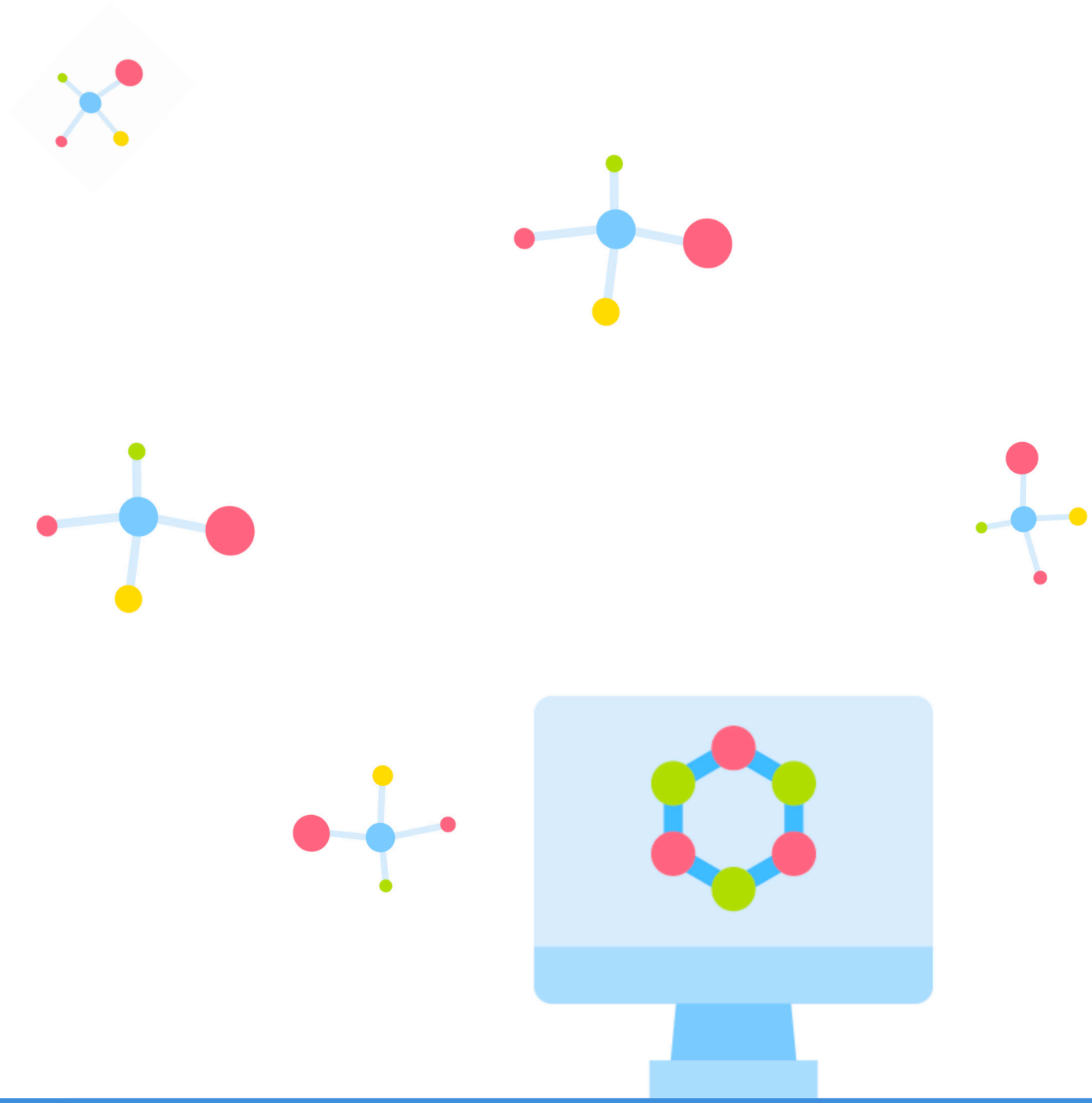

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