

Environmental Fate and Management of Pesticides (1002596)

Cursusomvang *(nominale waarden; effectieve waarden kunnen verschillen per opleiding)*

Studiepunten 6.0 **Studietijd 180 u**

Aanbodsessies en werkvormen in academiejaar 2023-2024

A (semester 1)	Engels	Gent	hoorcollege excursie werkcollege practicum
----------------	--------	------	-----------------------------------------------------

Lesgevers in academiejaar 2023-2024

Spanoghe, Pieter	LA21	Verantwoordelijk lesgever
Roman, Bart	LA24	Medelesgever

Aangeboden in onderstaande opleidingen in 2023-2024

	stptn	aanbodsessie
Master of Science in de bio-ingenieurswetenschappen: levensmiddelenwetenschappen en voeding	6	A
Master of Science in Environmental Science and Technology	6	A
Uitwisselingsprogramma bio-ingenieurswetenschappen: Food Science and Nutrition (niveau master-na-bachelor)	6	A
Uitwisselingsprogramma bio-ingenieurswetenschappen: landbouwkunde (niveau master-na-bachelor)	6	A
Uitwisselingsprogramma bio-ingenieurswetenschappen: milieutechnologie (niveau master-na-bachelor)	6	A

Onderwijstalen

Engels

Trefwoorden

Pesticides, Mode of action, QSAR, Residues, Fate, Toxicity, Human and Environmental exposure, Risk assessment

Situering

Pesticides and more specific plant protection products are studied during this course. The lectures handle the different steps of the life cycle of pesticides. The course starts with the identification of a new chemical having pesticides properties, it discusses the different mode of actions and toxicity, the authorization process, the application techniques and distribution and modelling in the environment (water and soil), the pesticide exposure of human (occupational exposure and consumer exposure) and ecosystems, the risk assessment and finally the clean-up of pesticides.

Inhoud

Theory

1. Introduction to pesticides: mode of action of plant protection products and biocides
2. QSAR (Quantitative, Structure, Activity, Relationship): a predictive tool for the identification of new active chemicals and a tool used for non-animal testing in risk assessment
3. Authorisation of new pesticides in the EU
4. Application of pesticides on crops
5. Occupational exposure to pesticides during and after pesticide application
6. Consumer exposure to pesticides and food safety
7. Environmental exposure to pesticides: droplet drift, air drift and dust drift
8. Obsolete stocks of pesticides and biopurification systems
9. Environmental fate: soil and water
10. Environmental fate: models used in authorization of pesticide authorization

11. Risk-indicators of pesticides for human and environment
12. Risk-communication on pesticides

Practical exercises

1. Computer exercise on the construction of a QSAR-model
2. Lab: Analysis of pesticides in surface water
3. Lab: Application of pesticides
4. Lab: Analysis of pesticides in food
5. Computer exercise on food safety risk assessment
6. Computer exercise on occupational exposure
7. Computer exercise on aquatic risk assessment
8. Lab: Leaching column experiment
9. Computer exercise on e-fate modelling
10. Class room debate on actual theme on pesticides
11. Excursion (company, government or analytical lab, ...)

Begincompetenties

- 1 Knowledge of analytical techniques, representative sampling and validation of analytical methods;
- 2 Soil and water Chemistry and physics
- 3 Basic of informatics and statistics.

Eindcompetenties

- 1 Have knowledge on the mode of action, benefits and side effects of the use of plant protection products
- 2 Have insight in the authorization procedures, models and data needs (monitoring) for plant protection products ensuring safe use pesticides reducing human and environmental pressure
- 3 Analyze pesticide residues in various matrices and interpret results, including quality of the data
- 4 Have an in depth knowledge of the quality of residue data
- 5 Perform human and environmental exposure and risk assessment of pesticides
- 6 Communicate science and risks about plant protection products to different stakeholders

Creditcontractvoorwaarde

Toelating tot dit opleidingsonderdeel via creditcontract is mogelijk mits gunstige beoordeling van de competenties

Examencontractvoorwaarde

Dit opleidingsonderdeel kan niet via examencontract gevolgd worden

Didactische werkvormen

Werkcollege, Excursie, Hoorcollege, Practicum

Toelichtingen bij de didactische werkvormen

Lecture

Practicals (groups of 2 students) + practical PC room classes + Reporting (permanent evaluation)

Seminar (debate / life discussion group) – preparation

Excursion

Leermateriaal

Slides and relevant documentation placed on UFORA. Software models for pesticide exposure and risk assessment placed on UFORA

Referenties

Vakinhoudelijke studiebegeleiding

Extra clarification from assistant, by e-mail and/or appointment

Evaluatiemomenten

periodegebonden en niet-periodegebonden evaluatie

Evaluatievormen bij periodegebonden evaluatie in de eerste examenperiode

Schriftelijke evaluatie

Evaluatievormen bij periodegebonden evaluatie in de tweede examenperiode

Schriftelijke evaluatie

Evaluatievormen bij niet-periodegebonden evaluatie

Werkstuk

Tweede examenkans in geval van niet-periodegebonden evaluatie

Niet van toepassing

Toelichtingen bij de evaluatievormen

NPE is by evaluation of reports (introduction, objective, material&methods, results&discussion, conclusion, learning) of weekly practicals.

Eindscoreberekening

Students need to have at least 10/20 for theory and 10/20 for practicals, if not they will fail for the whole course. The end-of-term assessment, the theory, will score for 66.6% of the total, practicals will score for 33.3%.