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Environmental chemistry (3CH1070)

Filières concernées	Nombre d'heures	Validation	Crédits ECTS
Bachelor en systèmes naturels	Cours: 2 ph	Voir ci-dessous	3

ph=période hebdomadaire, pg=période globale, j=jour, dj=demi-jour, h=heure, min=minute

Période d'enseignement:

- Semestre Automne

Equipe enseignante

Prof. Laurel ThomasArrigo (Teacher), Dr. Isabella Zelano (Teacher)

Contenu

- 1 Introduction - Awareness and sustainable development
- 2 Basics - The 12 principles of green chemistry
- 3 Environmental pollution - Waste, waste water and air emissions
- 4 New waste management - Photocatalysis, bioremediation
- 5 New energy management - Example of biofuels
- 6 Agrochemicals - Phytosanitary products and fertilizers
- 7 Agrifood - Biodegradable and biocompatible products
- 8 Pharmaceutical industry - Biomaterials
- 9 Green solvents - Agrosolvents, ionic fluids and biolubricants

Forme de l'évaluation

Student presentations and a 1 hour written exam

Modalités de rattrapage

See Forme de l'évaluation

Documentation

- 1) Introduction to green chemistry, 2nd Ed. 2010, Albert S. Matlack, CRC Press, Taylor & Francis group, Boca Raton, USA.
- 2) Green chemistry: An introductory text, 2nd Ed., 2010, Mike Lancaster, RSC Publishing, London, UK.
- 3) Green chemistry and engineering: A pathway to sustainability, 1st Ed. 2014, Marteel-Parrish & Abraham, Wiley VCH, UK.

Additional course materials are made available on Moodle.

Pré-requis

Organic Chemistry I,
General Chemistry I
Analytical Chemistry

Forme de l'enseignement

Ex cathedra course; seminars

Objectifs d'apprentissage

Au terme de la formation l'étudiant-e doit être capable de :

- Describe the major energy, natural resource management and sustainability issues
- Develop an argument based on scientific, economic and legal knowledge
- Relate environmental issues in a multidisciplinary team in a collaborative and constructive manner
- Analyse complex environmental problems
- Demonstrate knowledge and understanding of natural systems based on a multidisciplinary scientific approach
- Defend an argument adapted to the target audience
- Identify the components and interactions within a natural system

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Compétences transférables

- Simulate intellectual curiosity
- Communicate effectively, in writing and/or orally, in a rigorous and scientific manner
- Apply knowledge to concrete situations
- Communicate the results of an analysis orally
- Present a well-founded and eclectic critical analysis
- Identify the multiple issues and interactions characterizing a problem