



UNIVERSITY OF CALGARY
DEPARTMENT OF CHEMISTRY
COURSE SYLLABUS
FALL 2018

COURSE: CHEMISTRY 321 – Environmental Chemistry

LEC	DAYS	TIME	ROOM	INSTRUCTOR	OFFICE	PHONE	EMAIL	OFFICE HOURS
L01	Tu/Th	15:30-16:45	ICT 102	Dr. Kimura-Hara	SB 333	220-7519	s.kimurahara@ucalgary.ca	Tu/Th 16:45 – 18:00

COURSE WEBSITE or Desire 2 Learn (D2L): <https://d2l.ucalgary.ca/d2l/home/235273>

RECOMMENDED TEXTBOOKS:

Fundamentals of Environmental and Toxicological Chemistry: Sustainable Science, 4th Edition, by Stanley E. Manahan, CRC Press (2013), e-text ISBN: 9781466553187, available for purchase at the University bookstore or rent online at <https://bookshelf.vitalsource.com/#/books/9781466553187>.

- Elements of Environmental Chemistry, 2nd Edition, by Ronald Hites and Jonathan Raff, ISBN 978-1-118-04155-0
- "Environmental Chemistry", 5th or 4th Edition, by Colin Baird and Michael Cann, W.H. Freeman, NY.
- Environmental Chemistry: A global perspective, 3rd Edition, by G.W. vanLoon and S.J. Duffy, Oxford University Press

TOPICS COVERED AND RECOMMENDED READING:

Topic	Manahan (4 th ed.)
1. Review of chemical concepts	
Fundamentals: States of matter; gas laws; elements and chemical bonding; kinetics; equilibria; unit conversions; mass balance	Chapters 19
Organic Chemistry: definition, importance of carbon, functional groups and classification of organic compounds by focusing on toxic organic compounds and their environmental impacts	Chapter 20
2. Global biogeochemical cycles	Chapter 1
3. Toxicology	Chapter 2
4. Water chemistry and pollution	
Aqueous chemistry	Chapters 19.5, 3-4
Water pollution and contaminants of concern: pesticides, persistent organic pollutants (dioxins, furans, PCBs), endocrine disruptors, toxic metals	Chapters 4.10-4.13
Drinking water and wastewater treatment	Chapter 5
5. Soil chemistry	Chapters 10 -11
6. Environmental chemistry in the biosphere	
Chemistry and pollution of the atmosphere	Chapters 6-7
Catalytic destruction of stratospheric ozone and Montreal Protocol	Chapters 7.9, 8.11
Greenhouse effect and climate forcing	Chapters 8.1-8.3
7. Energy and Toxic Waste	

Energy	Chapter 17
Toxic waste and high-tech trash	Chapters 14-15

This course does not have a laboratory component.

Department Approval: Approved by Department Head Date: August 30, 2018